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UNIVERSITY OF ALBERTA

THE IMPACTS OF LARGE-SCALE RESOURCE PROJECTS ON RECIPIENT AND ADJACENT MUNICIPALITIES

BY

HUGH M. SEMPLE

©

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ARTS.

DEPARTMENT OF GEOGRAPHY
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THE IMPACT OF LARGE-SCALE RESOURCE PROJECTS ON RECIPIENT AND ADJACENT MUNICIPALITIES

SUBMITTED BY HUGH M. SEMPLE

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ARTS.

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SEPTEMBER 25, 1991

TO MY WIFE PENELOPE FOR HER PATIENCE, SUPPORT AND ENCOURAGEMENT.

TO MICHELLE, OUR DAUGHTER, WHO WAITED UP FOR HER DAD.

ABSTRACT

This thesis advances the view that although new large-scale resource industries generate a significant amount of new population, employment, income and tax receipts in non-metropolitan regions, only a few of the local communities that are affected by such projects are endowed with the capacity to translate these benefits into community development impulses. Further, unless appropriate macro-economic conditions exist, there is no guarantee that communities which are able to translate project impacts into growth impulses will necessarily do this when affected by a project.

In a hierarchical system of non-metropolitan communities, substantial demographic and economic benefits are not likely to flow to low order rural municipalities that host the project, but fiscal benefits can be enormous. On the other hand, the largest urban centre within commuting distance of the project may benefit the greatest from economic and demographic impacts, but may also encounter fiscal shortfalls due to high service and infrastructure costs for new residents. For the smaller towns that are within commuting distance of the project, there is a tendency for them to be effectively by-passed in terms of economic, demographic and fiscal benefits.

Variations in the distribution of benefits from mega-projects across geographical space suggest that adequate policies should be adopted at the level of individual municipalities to prevent over-investment in anticipation of a massive increase in population and business. Policies should also be adopted at the sub-regional level to ensure that a measure of the total project benefit is distributed in such a way that the entire sub-region benefits.

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TABLE OF CONTENTS

CHAPTERS 1 1

1.0. INTRODUCTION 1

1.1. Background to Study 1

1.2. Review of Literature...........................4

1.3. Summary of Research Objectives.................12

1.4. Study Area.....................................13

1.5. Organization of Thesis.........................15

CHAPTER 2...17

2.0. STUDY METHODOLOGY..............................17

2.1. Evaluation Design..............................17

2.2. Evaluation Period..............................21

2.3. Evaluation Criteria and Methods of Analysis....22

2.4. Data Sources...................................32

2.5. Study Limitations..............................34

CHAPTER 3...35

3.0. DEMOGRAPHIC IMPACTS OF PULP MILLS..............35

3.1. Baseline Population Analysis...................36

3.2. Impact of Pulp Mills on Population Growth......46

3.3. Distribution of Population Growth in Host and Adjacent Municipalities 56

3.4. Conclusion.....................................59

CHAPTER 4..62

4.0. ECONOMIC IMPACTS OF PULP MILLS................62

4.1. Baseline Economic Development Processes...62

4.2. Impact of Pulp Mills on Process of Economic Development......................67

4.3. Baseline Level of Economic Activity.......75

4.4. Impact of Pulp Mills on Level of Economic Activity..........................81

4.5. Spatial Distribution of Employment Within Impact Areas.......................89

4.6. Conclusion................................93

CHAPTER 5..96

5.0. MUNICIPAL FINANCIAL IMPACT OF PULP MILLS......96

5.1. Impact of Pulp Mills on Property Base of Host and Adjacent Municipalities.......97

5.2. Impact of Pulp Mills on Municipal Expenditure Patterns.....................113

5.3. Impact of Pulp Mills on Local Mill Rates...............................119

5.4. Impact of Pulp Mills on Municipal Debt Burden..............................126

5.5. Conclusion...............................132

CHAPTER 6...134

6.0. POLICY IMPLICATIONS OF LARGE-SCALE RESOURCE PROJECT FOR REGIONAL DEVELOPMENT.............134

6.1. Demographic Policies.....................134

6.2. Economic Policies........................136

6.3. Fiscal Policies............................139

CHAPTER 7..145
7.0. CONCLUSION..................................145

BIBLIOGRAPHY.....................................149
APPENDIX ONE.....................................159
APPENDIX TWO.....................................161
APPENDIX THREE...................................163
APPENDIX FOUR....................................164
APPENDIX FIVE....................................169

LIST OF TABLES

Table 2.1. Multiplier Estimates....................29

Table 3.1 Historical Population Growth, Grande Prairie Impact Area..............37

Table 3.2 Historical Population Growth, Peace River Impact Area.................38

Table 4.1 Number of Retail and Service Outlets, Grande Prairie Impact Area, 1971 and 1977............................70

Table 4.2 Value of Building Permits City of Grande Prairie, 1965 to 1976....................................71

Table 4.3 Value of Building Permits, Town of Peace River, 1982 - 1990........73

Table 4.4 Employment Status of Labour Force, Grande Prairie Impact Area, 1971 78

Table 4.5 Employment Status of Labour Force, Peace River Impact Area, 1976 - 1986.............................80

Table 4.6 Daishowa's Construction Workforce by Skill Type.................83

Table 4.7. Total Employment Creation Operational Phase.........................88

Table 4.8. Spatial Distribution of Employment, 1971 - 1976, Grande Prairie Impact Area.............................90

Table 4.9. Approximate Direct Income Flowing to Impact Areas.................92

Table 4.10. Approximate Secondary Income Flowing to Impact Areas 93

Table 5.1. Equalized Assessment, Grande Prairie Impact Area 1965 - 1976..............................99

Table 5.2. Equalized Assessment, Peace River Impact Area 1984 - 1991............................105

Table 5.3. Per Capita Equalized Assessment Grande Prairie Impact Area 1965 - 1976............................108

Table 5.4. Per Capita Equalized Assessment Peace River Impact Area, 1984 - 1991............................111

Table 5.5. Total Operating Expenditure Grande Prairie Impact Area 1965 - 1976............................114

Table 5.6. Total Operating Expenditure Peace River Impact Area, 1984 - 1989............................117

Table 5.7. Equalized Local Mill Rates, Grande Prairie Impact Area, 1965 - 1976............................121

Table 5.8. Equalized Local Mill Rates, Peace River Impact Area, 1984 - 1989............................124

Table 5.9. Debenture Debt Per Capita, Grande Prairie Impact Area, 1965 - 1976............................127

Table 5.10. Debenture Debt Per Capita, Peace River Impact Area, 1984 - 1989............................130

LIST OF FIGURES

Figure 1.1. Map of Study Area 14

Figure 3.1. Baseline Population Distribution, Grande Prairie Impact Area..............41

Figure 3.2. Baseline Population Distribution, Peace River Impact Area.................43

Figure 3.3. Estimated and Actual Population Growth, 1961 - 1976, Grande Prairie Impact Area..............47

Figure 5.1. Equalized Assessment, Grande Prairie Impact Area 1965 - 1976...........................100

Figure 5.2. Equalized Assessment, Peace River Impact Area 1984 - 1991...........................106

Figure 5.3. Per Capita Equalized Assessment Grande Prairie Impact Area 1965 - 1976...........................109

Figure 5.4 Per Capita Equalized Assessment Peace River Impact Area, 1984 - 1991...........................112

Figure 5.5. Total Operating Expenditure Grande Prairie Impact Area 1965 - 1976...........................115

Figure 5.6. Total Operating Expenditure Peace River Impact Area, 1984 - 1989...........................118

Figure 5.7. Equalized Local Mill Rates, Grande Prairie Impact Area, 1965 - 1976...........................122

Figure 5.8. Equalized Local Mill Rates, Peace River Impact Area, 1984 - 1989...........................125

Figure 5.9 Debenture Debt Per Capita, Grande Prairie Impact Area, 1965 - 1976.............................128

Figure 5.10 Debenture Debt Per Capita, Peace River Impact Area, 1984 - 1989.............................131

CHAPTER ONE

1.0. INTRODUCTION

This study is primarily an ex-post evaluation of the impacts of large-scale resource industries on municipalities in northern Alberta. Specifically, the study seeks to determine the level of demographic, economic, and fiscal benefits that the Proctor and Gamble and the Daishowa Canada pulp mills have brought, first, to the municipalities that host the mills, and secondly, to the municipalities that are adjacent to the host municipalities. By investigating the specific case of pulp mills in Grande Prairie and Peace River, the study seeks to address the broader issue of how large-scale resource projects affect the process of local economic development in northern Alberta. Further, the study seeks to utilize these case examples to illustrate the extent to which rural municipalities can depend on large-scale industries as mechanisms for long term growth and development.

1.1. Background To Study

This retrospective study into the impacts of large-scale resource projects was prompted by two separate concerns in the

Grande Prairie and Peace River areas regarding the socio-economic effects of pulp mills on the local communities in those areas.

At Grande Prairie, plans were announced in 1988 by Proctor and Gamble Cellulose Ltd. to double the size of their pulp mill by the mid 1990s.[1/] This announcement has created an atmosphere of expectancy in the Grande Prairie area as regards increased local employment, wage and salary income, business opportunities, and property tax revenue. But the general climate of optimism has been tempered by a realization among some officials that not all large-scale projects generate the level of local benefits that are stated in ex-ante feasibility studies. The need has been thus expressed for detailed information on the precise impacts of the present mill. This would facilitate informed decisions by the local public sector about the level of investment that might be required to support the mill, and by the private sector about the level of spin-off effects that can be expected. This study has emerged as an attempt to help fill the information gap that exists viz a viz the precise manner in which the existing Proctor and

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1/ On December 15, 1988, major expansion plans were announced by Proctor and Gamble to increase production from 820 tonnes per day to 1740 tonnes per day of bleached kraft pulp (See Alberta Environment, Factsheet, Alberta Pulp and Paper Projects, September, 1989).

Gamble mill has affected the demography, economy, and tax base of the municipalities associated with the mill.

In the Peace River area, Daishowa Canada Co. Ltd. has established a similar type and size of pulp mill as the existing one in Grande Prairie. Since 1988 when construction work began on the mill, there has been a widespread focus in the media on the possible environmental impacts of the mill. This has overshadowed the on-going debate at the local level about the socio-economic benefits of the mill to the town of Peace River and the adjoining municipalities.

Prior to the establishment of the mill, several ex-ante studies about the likely effects of the mill were sponsored by the resource company.[2/] These studies indicated that the town of Peace River and the adjoining municipalities would all experience significant growth in population, jobs, and business following the establishment of the mill. The studies also forecasted significant increases in municipal revenue from taxation of the new mill as well as from housing the new population.

2/ One of the major studies was done by H.A.Simons Ltd. Environmental Impact Assessment Report (Daishowa Canada Co. Ltd. January, 1988). The findings of this Impact Statement have been widely quoted in this thesis.

Despite the arrival of the mill, present economic conditions in the Peace River area suggest that many of the prognostications in the impact studies have fallen well below expected levels. Local decision-makers are aware that the municipalities within the Peace River area have derived some benefits from the presence of the mill, but the precise magnitude of benefits and their spatial distribution are not known and this has become the source of much debate. The demographic, economic and fiscal impacts of the Daishowa mill during its construction and start-up phases are thus major issues in the Peace River area. This study has thus been prompted also by the need to make an objective contribution to the discussion on the impacts of the Daishowa mill on the municipalities with which it is associated. It is hoped that by comparing the experience of Grande Prairie with that of Peace River, significant insights would be gained as to how large-scale resource industries affect the municipalities that host them and also those municipalities that are adjacent to the host municipality.

1.2. Review of Literature

To effect the study, a review was first done of the literature that deals with the impacts of large-scale resource projects on the communities with which they are associated. The review revealed that most of the literature on community impacts of large scale resource projects are predictive in scope, that is, they deal with impacts before the projects are actually undertaken. One of the main reasons for this is that legislation both in Canada and the United States requires that Environmental Impact Statements for large-scale resource and other projects also include sections dealing with the socio-economic impacts of such development on the community with which they are associated (D'Amore and Rittenberg, 1978; Rohe, 1982). As a result, there is an impressively large amount of ex-ante studies conducted each year and the techniques for conducting these studies are well developed.[3]

With respect to ex-post studies of large-scale resource projects, the review revealed that comparatively few such studies are available. For those which are available, most of them deal only with the American mid-western experience. Only a few studies are available that deal with the experience of other countries including that of Canada.[4] It is also observed that a great deal of overlap exists in many of the American studies in that they deal not only with the impacts of resource-based industries, but also with the impacts of manufacturing industries in general that move into non-metropolitan areas. Notwithstanding the nature of past studies that deal with the actual impacts of large-scale projects on non-metropolitan communities, the experiences reported still provide a basis for understanding how large-scale resource-based industries might affect the municipalities with which they are associated.

---

[3] Techniques for economic impact assessment can be found in works by Weber and Howell (1982), Leistritz and Murdock (1981), and Leistritz and Murdock (1982). See also Czamanski and Maliza (1969), Davis (1976), Glickman (1977), and McGuire (1983). For fiscal impact assessment, important works dealing with techniques of analysis include Burchell and Listokin (1978), Gerweck and Epp (1974), and Kee (1969).

Regarding fiscal impacts, Garrison (1971) in a study of five small towns in Kentucky found that all the municipalities experienced a negative impact on their finances as a result of having to provide additional infrastructure to migrant workers and their families. At the same time, he discovered that the local economies as a whole benefitted substantially as a result of increases in the personal income of residents. Garrison thus concluded, that while the local public sector of a municipality may encounter fiscal difficulties as a result of the establishment of a new large industry, substantial

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4/ Examples of Canadian studies from Alberta include Ebel (1985), and Peter Nichols and Associates (1979).

economic benefits may nevertheless flow to local private individuals and businesses.

Garrison's findings on fiscal impacts have been substantiated in several reviews of other case studies of the actual fiscal impacts of large-scale industries on non-metropolitan communities (e.g. Summers 1979; Summers, Beck, and Snipp, 1979; and Seyler and Lonsdale, 1979). Generally, these reviewers have found that in the majority of cases, the fiscal benefits of new industries, measured in terms of excess of tax receipts over industry related costs, are only minimal or negative. Their findings are in stark contrast to the findings of studies published during the 1950s for metropolitan areas in the United States where revenue from new industries were reported to exceed the public costs of new infrastructure by ratios ranging from 3:1 to 4:1.[5]

One of the main reasons why non-metropolitan municipalities have not generally experienced substantial net fiscal benefits from large-scale industrial development is because in these areas, industrial development is almost invariably accompanied

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5/ Some of these studies are cited in Lowenstein (1963). They include Robert E. Coughlin and Walter Isard, Municipal Costs and Revenues Resulting from Community Growth, (Wellesley, Mass., Chandler-Davis Publishing Co., 1957); and Frederick P. Clark and Associates, Economic Studies, Greenwich, Connecticut, 1954.

by a large number of migrant workers. This means that municipalities are often required to make large investments in additional infrastructure and services to support the needs of the migrant workforce. Unfortunately, the level of investment in the majority of cases tends to exceed the new revenue earned (Margolis, 1957; Barlow, 1971) and the net fiscal benefit is negative at the beginning of the project. This may however improve slightly as costs are recovered over time (Weber and Murray, 1982). The only exception is where the municipality that hosts the industry, does not, at the same time, host the workers of the new industry. In such a case, the host municipality may experience significant tax windfalls. However, compensationary arrangements may significantly reduce this tax benefit. It appears therefore that unless support from higher levels of government is obtained, the public costs of new industry can indeed be very high for many municipalities and the quality of existing services can be compromised instead of enhanced.

As regards local economic benefits, measured in terms of income, employment, and business opportunities, the conclusion of Summers, Beck, and Snipp (1979) after a review of a wide range of case studies done in the United States, is that the number of persons working in a community and the amount of money in circulation will definitely increase following a major development. Leistritz et al. (1982) in their review of case studies done in the United States also substantiate this point but they note that most of the economic benefits will occur during the construction phase of the project. During the operational phase of the industry, both employment and income is likely to decrease and stabilize at a lower level. Leistritz and his colleagues also observe that boomtown situations are more the exception than the rule. Thus only few communities are able to achieve growth levels comparable to that of Fort McMurray, Alberta [6/] and Rock Springs, Wyoming.[7/]

While it is true that large-scale industries bring an overall increase in the number of persons working in a community and the amount of income circulating, it is also true that much of these benefits do not go to long time residents of the area, neither are they retained in the local municipalities (Ironside and Mellor, 1974 ; Shaffer, 1979). Several factors account for this. Firstly, many local people are not usually employed by the new industry because they lack the skills to

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6/ See Peter C. Nichols and Associates, Overview of Local Economic Development in the Athabasca Sands Region Since 1961. Alberta Oil Sands Environmental Research Programme, Edmonton, 1979.

7/ See John Gilmore and Mary Duff, Boom Town Growth Management: A Case Study of Rock Springs - Green River, Wyoming, Westview Press, Boulder Colorado, 1977.

make use of the new jobs created in their communities, thus the jobs are filled by migrant workers. Secondly, the much vaunted increase in local business activities may not materialize in many instances because new large-scale industries in non-metropolitan communities tend to maintain old supply links outside of the local communities (Moseley 1974). Thirdly, many local communities lose some of the benefits of new industrial development because their business sector cannot respond to the needs of migrant workers for higher order retail goods and services, and also to the need of the new industry where certain supplies are desired to be bought locally (Shaffer et.al. 1981).

Altogether, the findings of past studies give a general impression of what may happen when large-scale industries move into non-metropolitan communities. However, one is still unable to use these generalized and site-specific comments to tell what has actually happened in a newly affected community. This is because each community is unique and its experience with large-scale industries may be quite different from that of other communities. There is always the need therefore, to conduct detailed case studies to deal with questions asked about any specific community.

The need for detailed case studies became evident in the Grande Prairie and Peace River areas. However, as a contribution to the general understanding of how large-scale resource based industries affect non-metropolitan communities, this study differs from most previous ones in that it discusses impacts experienced at a broader geographical scale than a single municipality. Past research has concentrated mostly on impacts that are experienced by the single host municipality. Even in instances where several municipalities are recognised as the "host" 8/, the inter-municipal distribution of projects impacts have not been widely discussed, except in the case of fiscal impacts (e.g. Barlow 1971; Lowenstein, 1973).

This study focuses on impacts that are generated throughout the commuting zone of the resource industry. Impacts are first analyzed at the level of the commuting zone as a whole to grasp the total amount of benefits that were brought to the impacted areas. Secondly, impacts are investigated at the level of individual municipalities in order to observe the spatial distribution of impacts within the commuting zone of

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8/ See John Glasson, Dominique Van Der Wee, and Brendan Barrett, "A Local Income and Employment Multiplier Analysis of a Proposed Nuclear Power Station Development at Hinkley Point in Somerset". Urban Studies, 1989, pp. 248 - 261.

the industry. The benefit of such an approach is that from a planning perspective, it allows the various municipalities or types of municipalities to understand how they were affected by the resource industry. On the basis of this knowledge they can then determine the extent to which they are able to depend on resource industries located either within or adjacent to their jurisdiction, as major instruments for economic development.

1.3. Summary of Research Objectives

In view of the preceding discussion, the objectives of this research may be summarized as follows:

1. To determine whether pulp mill development has brought significant population increases to municipalities in northern Alberta that are within the commuting zone of the pulp mills.

2. To determine the impact of pulp mill development on aggregate income and employment within the municipalities that host the mills and those which are in close proximity to the host municipalities.

3. To determine the net fiscal impact of the pulp mills on local public finances .

4. To determine the extent to which municipalities can depend on large-scale resource industries as instruments for economic development in northern Alberta.

1.4. The Study Area

The study areas comprise the incorporated municipalities that are located within approximately 50km from the Proctor and Gamble and Daishowa pulp mills (Figure 1.). The study areas consist of the municipalities that host the mills and the municipalities that are adjacent to the host municipality.

In the Grande Prairie area, the host municipality is the County of Grande Prairie in the South Peace Region of Alberta. The municipalities adjacent to the host municipality include the City of Grande Prairie which is the main service centre in the area, the towns of Sexsmith, Wembley, and Beaverlodge, and the village of Hythe. In addition, there are several unincorporated hamlets and country residential sub-divisions but these have been excluded due to the unavailability of data.

In the Peace River area, the host municipality is Improvement District 22 which is located in the North Peace Region of

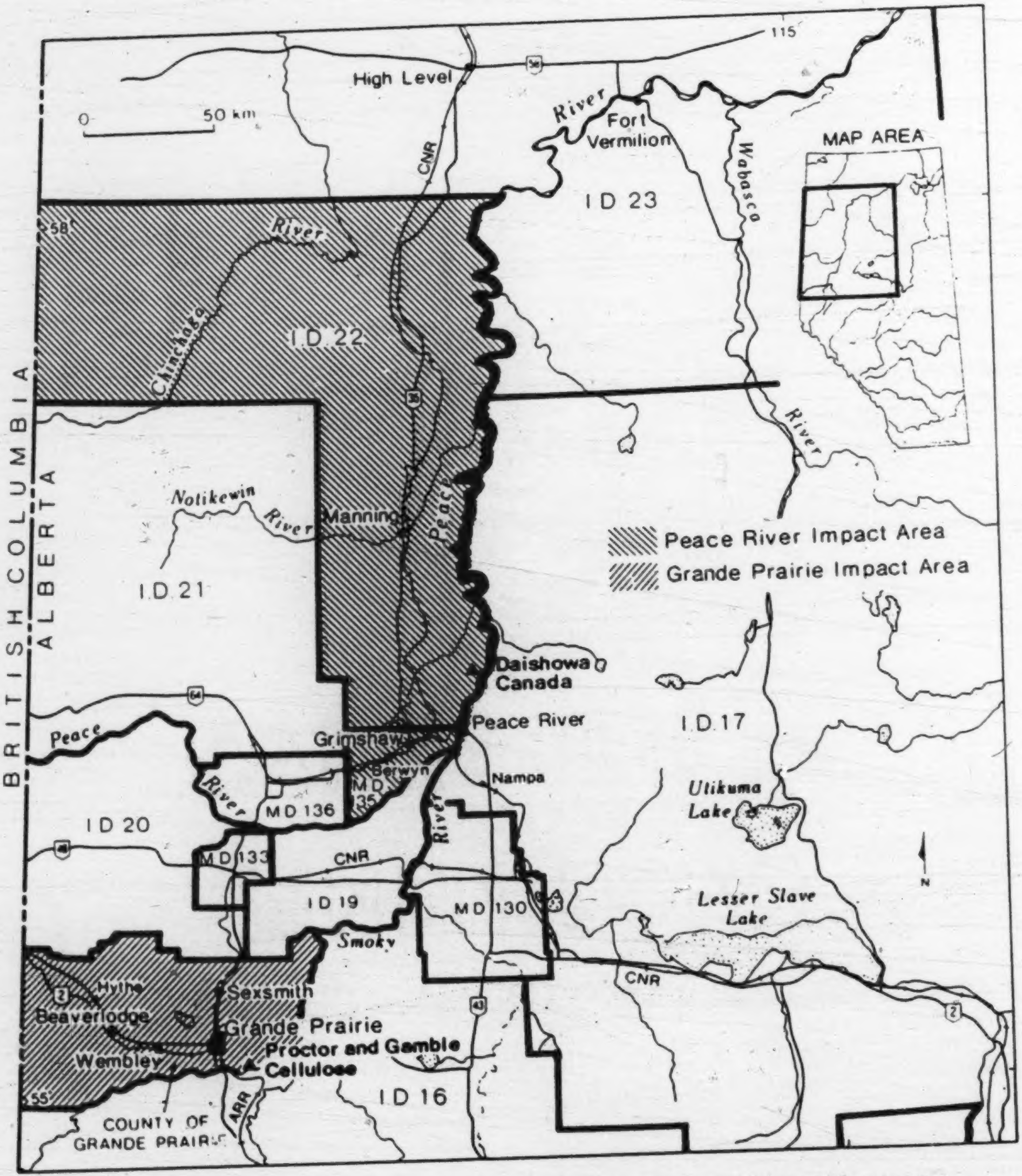

Figure 1. Grande Prairie and Peace River pulp mill impact areas.

Alberta. The municipalities that are adjacent to the host municipality are the town of Peace River, which is the main service centre in the area, the towns of Grimshaw and Manning, the villages of Nampa and Berwyn, Municipal District 135, and Improvement District 17W.

For purposes of convenience, the municipalities which are associated with each pulp mill are singularly referred to as the "Impact Area" of the mill throughout the study. The federal census of 1971, the year in which construction began on the Proctor and Gamble mill, locates the Grande Prairie Impact Area in Census Division 15. Due to the recent changes in the federal census divisions in Alberta, the Peace River Impact Area is located in Census Divisions 17, 18, and 19.

1.5. Organization of Thesis

The thesis is organized as follows: In Chapter Two, the evaluation design and analytical techniques selected to carry out the research are discussed. Data sources and the quality of the data used are also discussed.

Chapter Three analyses the demographic changes associated with the pulp mills while in Chapter Four, the economic impacts of pulp mill development in Grande Prairie and Peace River are investigated. The economic analysis focuses on the impact of the pulp mills on the long term economic development process in the host and adjacent municipalities. It also deals with the levels of local employment and income that were generated by the mills and how these were distributed among municipalities within the Impact Areas. Other concerns of this Chapter are the extent to which local residents benefit from increased employment and income.

In Chapter Five, the question as to whether the local public sectors were able to provide the required infrastructure and municipal services to meet the needs of the mill-induced population, without incurring large debts and imposing high rates of property taxation is discussed.

On the basis of the findings of the previous three chapters, Chapter Six discusses the policy implications of small communities located in resource frontier regions depending on modern resource development as an important mechanism for economic development. Chapter Seven concludes the thesis.

CHAPTER TWO

2.0. STUDY METHODOLOGY

2.1. Evaluation Design

To respond to the research objectives as set out in the preceding Chapter, it was necessary to first select an overall approach to evaluation. This is the evaluation framework or design that will be used to determine the level of changes that occurred in the Impact Areas following the establishment of the mills. The evaluation framework also sets the rules for determining whether the changes that did occur were in fact the result of the project activity and not the effects of existing trends or other concurrent social forces. From a review of ex-post evaluations designs, it was determined that there are four broad categories of evaluation designs or frameworks (Poister et.al. 1979, Hatry et al. 1981). These designs are the before and after design; the design based on the comparison of time series data before the project with time series data after the project; the design based on a comparison with a population that is not affected by a similar development; and controlled, randomized experimentation.

For the purpose of this study, an approach based on controlled randomized experimentation was ruled out because this requires strict control over both the project effects and the effects of other circumstances affecting community change. Clearly, such an approach can only be used for laboratory type experiments and are not suitable for evaluating open community systems where there are few controls over the variables involved. The approach based on comparisons with communities not affected by similar development was also not used because of the difficulties of finding settlement systems of comparable size and structure like those affected by the pulp mills. The designs considered most relevant to this study were the "Before and After" design and the "Time Series" design. This is because their evaluative framework best suited the data base that exists for the study area. These two frameworks are explained below.

The Before and after Design is an approach to ex-post evaluation in which conditions at a point in time before the project began are compared with conditions at another point in time after the project is initiated. The differences in conditions in the community is attributed to the project, providing that no other explanation can be found to account for the changes. Some writers, for example, Rossi and Freeman, (1989) take conditions both before and after the project to mean conditions at a fixed point in time. Other writers, for example, Poister et al. (1979) argue that the data collected does not necessarily have to represent conditions at a fixed point in time, but could also represent a process up to that point in time. To improve the depth of analysis, conditions after the project is initiated could be compared with projected goals of the project to determine the effectiveness of the project in meeting community needs and expectations.

The before and after design is a widely used evaluation design primarily because of its simplicity, its cost-effectiveness, and because it does not require the construction of an extensive data base. Despite these advantages, the design suffers from an important shortcoming in that it does not have any internal method of differentiating between project effects and the effects of other non-project influences. This means that cause and effect relationships between the project and the supposed impacts cannot be determined internally by the evaluation design.

In the design based on a comparison of time trend data with actual post project time-series, the impacts of a project are considered to be the differences between present trends and the trends that would have been expected if the project had not been instituted (Rossi and Freeman, 1989). This method is statistically more reliable than the previous method because a greater number of observations are taken of pre-impact and post-impact conditions. The analyst can thus be more assured that a trend is being dealt with and not extreme values. Although it is an improvement over the design mentioned above, the method can still accommodate many non-project influences and cause and effect relationships are more difficult to determine the longer the post-project evaluation period.

As can be seen, both the before and after design and the time series design use a similar theoretical argument for identifying project impacts. The basic argument, as applied to this study, is that if significant demographic, economic, and public financial changes occurred as a result of the pulp mills, these would show up as departures from the regular trend in the indicators that are continuously used to measure these phenomena at the community level. This conceptual similarity renders it easy to use both frameworks in a single study.

The main reason, nevertheless, why both frameworks are used in this study is that the data available to conduct the ex-post evaluation exists in both time series and non-time series format. Thus, where the data is available in time series format, the evaluation design based on comparison of time series data was deemed appropriate. In cases where the data could not permit time series analysis, the simple before and after comparison was used. It should be noted that the idea of using two or evaluative frameworks in a single study is not a new innovation. It has been suggested for use, for example by Poister et. al. (1979) whenever the available data does not permit the use of a single evaluative framework.

2.2. Evaluation Period

For the Grande Prairie Impact Area, the evaluation period is from 1971 to 1976. This period includes the construction phase of the mill, 1971 to 1973, and the early operational phase of the mill, 1973 to 1976. The years 1971 to 1976 were chosen as the evaluation period because during this time, the pulp mill was the single, most important new economic activity in the Impact Area. This made it possible to control for the influences of other major concurrent events which occurred after 1976. After 1976, the Grande Impact Area benefitted from a number of other major economic developments which made it difficult to desegregate the effects of the mill from other influences.

In the Peace River Impact Area, the evaluation period is from 1988 to 1990. Again, this was also a period during which the most important new economic development in the area was pulp mill development. Since the mill has only recently begun operation, impacts are mostly discussed for the construction phase of the mill.

2.3. Evaluation Criteria and Methods of Analysis

Having decided on the overall evaluation design and evaluation period, the next step was to specify the evaluation criteria used in the study and the methods used to measure the impacts that were obtained. The evaluation criteria refers to the indicators which are used to measure the extent of project impacts. In general, evaluation criteria are required to be clearly definable so that accurate measurement can take place.

Demographic Criteria and Method of Analysis

In the demographic analysis, the two evaluation criteria were changes in total population size and changes in the geographical distribution of population within the study area. Baseline data extending for two decades prior to the arrival of the pulp mills were analyzed and these were compared with post-project trends in the intercensal period after the establishment of the mills. Since population data were available in time series format, time series analysis was used to analyze the data.

The time series analysis was conducted as follows: Regression Analysis was used to determine the baseline trend in population growth. The Regression equation was then used to predict the population growth during the period of the early operational phase of the mills but assuming that there was no mill. The actual population growth during the impact period was then compared with the predicted growth. Variations between the predicted population growth and the actual post-project growth were interpreted as caused by the pulp mill unless it was known for certain, that other factors influenced the post-project trend.

Economic Criteria and Methods of Analysis

For the economic analysis, most of the indicators of economic activity used at the national level could not be used at the local level because data are not collected for these variables. Common measures of local economic activity include sales, value added, income, and employment. In this study, the evaluation criteria are changes in employment, unemployment, income, the number of business establishments, and the value of building permits. To conduct aspects of the economic analysis dealing with employment and income, the evaluation designs as specified earlier could not be entirely used because baseline employment and income data, prior to 1971 were not available for the municipalities in the Grande Prairie Impact Area. Also, for the municipalities in the Peace River Impact Area, post-project employment data would not be available until after the 1991 federal census. A slightly different approach was therefore used to estimate employment and income. This is discussed below.

Employment

The objective of the employment analysis was to measure the magnitude of direct and indirect jobs created by the pulp mills, the spatial distribution of this employment, and how this has affected local unemployment rates.

Direct employment was determined from data obtained from Proctor and Gamble and Daishowa Canada pulp mills. Secondary employment was estimated using export base multiplier analysis. Although conceptually elementary, economic base multipliers were used to estimate secondary employment because the data base for both Grande Prairie and Peace River is not sufficiently developed to allow the use of more sophisticated techniques such as Input-Output analysis and Keynesian interregional trade multiplier models.

To compute the economic base multipliers, employment data for 37 industrial sectors for the Grande Prairie Impact Area and 19 sectors for the Peace River Impact Area were obtained from the 1971 and 1986 federal censuses respectively (See Appendix Four). Separation of basic and non-basic employment in each industrial sector was accomplished through a combination of the Assumption Approach and the Location Quotient method.

The Assumption Approach allocates basic / non-basic employment in the primary and some service sectors on the basis of informed assumptions made by the analyst (Bendavid, 1972; Braschler and Kuehn, 1976). In this study, all employment in primary industries is allocated to the basic sector on the assumption that in small communities, the output of those industries would be mostly for export. Although some local consumption does, in fact, take place, this is not expected to be large and its effect on the final results is not likely to be substantial. Secondly, it is assumed that half of all employment in federal and provincial government services, accommodation and food services, and amusement and recreation is sustained by demand originating from outside the impact area. Such employment is therefore regarded as basic.[9]

For those industries in which employment could not be allocated by the Assumption approach, basic employment was determined by the Location Quotient method.[10] The Location Quotient is a measure of the relative concentration of workers in a subject industry in a local area with that of the same industry in a chosen benchmark area. If the local area has a higher concentration of employees in the subject industry than the benchmark area, the Location Quotient would be greater than 1.00 and the surplus workers in the local area are assumed to be involved in production for export, that is, basic employment. A Location Quotient of 1.00 means that both the local area and the benchmark economy has the same degree of concentration of workers in a particular industry and there are no workers in that industry that are involved in export activity in both the subject and benchmark economies. A

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[9] Bendavid (1972) suggests that all employment in these categories should be allocated to the basic sector. However, this is considered as too generous an allocation since a large demand for these services comes from residents within any given municipality. For this reason, it was decided to allocate half of all employment in these categories to the basic sector.

[10] See Isserman (1977) for a justification of the use of the location quotient method in economic base analysis.

Location Quotient that is less than 1.00 means that the benchmark economy has a higher concentration of workers in that industry and is thus exporting goods from that industry to the subject economy. Location Quotients for the various industrial sectors were calculated using the following formula:

$$LQ = \frac{E_{ir}}{E_{ip}} \backslash \frac{E_r}{Ep}$$

where LQ = Location Quotient

E_{ir} = employment in industry i in the subject industry.

E_{ip} = employment in industry j in the provincial economy (The benchmark economy was considered to be the Province of Alberta).

E_r = total employment in the subject industry

E_p = total employment in benchmark economy.

The proportion of basic to non-basic workers in each industry was obtained by applying a "Specialization Ratio" (Thompson 1959). The specialization ratio indicates the actual amount of employment in the specialized industries of the subject economy that is supported by external receipts, Specialization ratios were computed with the following formula:

$$S.R. = \frac{LQ - 1}{LQ}$$

where S.R. = Specialization Ratio
L.Q. = Location Quotient

Specialization ratios were computed for each industrial sector and then applied to total employment in the sector to obtain the basic / non-basic employment levels for each industry. (See Appendix 4). The employment multiplier K_1 is calculated from the following formula:

$$K_1 = \frac{E_t}{E_b}$$

where E_t = total employment in benchmark economy
E_b = total basic employment in subject economy

The multiplier analysis yielded values of 2.29 for Grande Prairie using 1971 data and 2.3 for Peace River using 1986 data. Clearly, these multipliers are too high for the small, undiversified economies that make up the two impact areas.

In a recent study by Ironside and Fieguth (1990), the issue of the size of multipliers for communities impacted by pulp mills in Northern Alberta was discussed. According to the authors, a multiplier value of 1.2 seems to more accurately reflect the reality of secondary employment generation in northern Alberta. Notwithstanding, since there is no single value that can be termed the "correct multiplier", a number of other multipliers obtained from previous research in northern Alberta were used to improve the validity of the employment forecasts made for the two impact areas. These multipliers are shown in Table 2.1.

Table 2.1.

MULTIPLIER ESTIMATES

Source	Employment Multiplier	Income Multiplier
Wright, 1962	2.68	1.52
Mellor and Ironside, 1978	1.2	1.2
Praxis, 1990 cited in Ironside and Fieguth (1990)	1.2 - 1.3	-
Monroe and Robinson, 1973	-	1.49
Simon (1988) Daishowa	1.7	-

Wright's multipliers calculated for Alberta as a whole, like those calculated in this study, were considered as too high for the Impact Areas. Also, the multiplier of 1.7 used in the Daishowa Impact Assessment was regarded as too high for the Peace River Region given the few industrial linkages and commercial enterprises that exist in that area. Based on the work of Ironside and Fieguth (1990), it was thought best to use the range of multipliers of 1.2 and 1.3 as supplied by Praxis for both Peace River and Grande Prairie. These multipliers also corroborate closely with those suggested in an earlier study by Mellor and Ironside (1978).

Income

The income analysis sought to estimate the level of direct and secondary income that became available to the municipalities as a whole following the establishment of the pulp mills. New direct income that became available to the Impact Areas was determined from tax payments made by the pulp mills, goods and services purchased locally by the pulp mills, and the total wage bill of the pulp mills.

One of the weaknesses of this method of calculating direct income is that it assumes that all injections will remain in the local communities. However, even at the initial stage of injection, there will be substantial leakages from the local economy, primarily from migrant workers who remit part of their wages and salaries to their families outside of the Impact Areas.

Secondary income was estimated using multiplier analysis. Given the empirical difficulties associated with the calculation of income multipliers and the consequent low level of reliability that could be placed on such multipliers if the estimation is not supported by extensive data collection (Leistritz et al. 1982), income multipliers were not calculated for this study. Instead, the income multiplier of 1.2 as suggested by Mellor and Ironside (1978) was used to estimate secondary income.

Fiscal Impacts

To study the impacts of the pulp mills on municipal finances, a number of fiscal indicators were analyzed to obtain a view of the overall changes in the financial situation of the municipalities during the evaluation period. These indicators include size of the assessment base, mill rates, per capita debt, and debt service costs.

The impact of the pulp mills on the assessment base of the municipalities, mill rates, per capita debt, per capita costs of public services etc., were all estimated by time-series analysis on the assumptions that deviations from the normal trend of increase in the fiscal indicators were caused by the pulp mills. Such an approach is justified on the grounds that it is almost impossible to trace all direct and indirect revenue and cost obtained as a specific result of any development project (Burchell and Listokin, 1978). Hence, by assuming that only those costs and revenue that show up as deviations from the norm are project costs, one escapes the overestimation that is inherent in approaches that uses average costs figures to estimate project costs and revenue. The main drawback in this approach, however, is that it does not make allowance for other non-project influences that might alter the base line trends.

2.4. DATA SOURCES

Data used in this study were obtained primarily from secondary sources. Secondary data were used because the evaluation period for the Grande Prairie Impact Area, 1971 - 1976, is so dated that direct surveys were immediately ruled out. Although, the Daishowa mill is very recent and direct surveys could have been conducted, it was thought that in order to maintain consistency in the study methodology, an indirect method of impact estimation should be used in both cases. Data were obtained from the following sources:

1. Existing economic base studies of the affected municipalities;[11] municipal plans; annual municipal financial statements; consultants' and other reports; and municipal and federal censuses.

2. Interviews with officials from the affected municipalities, the MacKenzie Regional Planning Commission, the South Peace Regional Planning Commission, and from the pulp mills who could provide insight and background into the topic area.[12]

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[11] The main economic base studies used were: Fairbairn K.J. and Ironside R.G. *An Economic Base Study of the Peace Region of Alberta*, Peace River Regional Planning Commission 1973; Hollinshead, Lefrancois and Associates, *Grande Prairie Growth Study,* 1979; South Peace Regional Planning Commission, *Grande Prairie Growth Study Update,* 1984; Mackenzie Regional Planning Commission, *An Economic Overview of the Mackenzie Region* 1989; Mackenzie Regional Planning Commission, *Town of Peace River Economic Base Study*, 1989.

[12] See Appendix One for list of officials.

2.5. Study Limitations

In a number of instances, the research was hampered because of the unavailability of certain data categories including the community forecasts done by Proctor and Gamble. In other instances, important assumptions have had to be made which were critical to the final conclusions drawn. Lastly, the techniques of analysis which are available to conduct an ex-post impact assessment are not sufficiently developed as those used to conduct ex-ante assessment. As a result, precise measurements were difficult to obtain at times and this hampered the establishment of causal relationships.

These methodological weaknesses are recognised to be common to both ex-post analysis in general, and also to studies conducted in small geographical units. Since they have consistently escaped resolution, the weaknesses noted above have had to be admitted into the study. This should be borne in mind when interpreting the results of this and similar studies.

CHAPTER THREE

3.0. DEMOGRAPHIC IMPACT OF PULP MILL DEVELOPMENT ON THE GRANDE PRAIRIE AND PEACE RIVER IMPACT AREAS

This Chapter analyzes the size and spatial distribution of population impacts induced by the pulp mills within the Grande Prairie and Peace River Impact Areas. The findings of the analysis indicate that although population increased significantly in the Grande Prairie Impact Area during the evaluation period, pulp mill development may have contributed less to population growth than is generally thought. In the Peace River Impact Area, pulp mill development has not had any noticeable impact on population growth. The analysis further indicates that for both impact areas, the population levels in the rural municipalities that host the mills have only minimally increased over their baseline levels. In the small towns, increases in population have also been significantly small. Only in the City of Grande Prairie has there been any appreciable increase in population, reflecting the urban bias of modern resource development.

The Chapter first considers the baseline changes in the municipal population, and then examines population trends after the arrival of the pulp mills.

3.1. Baseline Population Analysis

Population Growth

Analysis of baseline population change for the Grande Prairie Impact Area shows that during the two decades prior to the establishment of the mill, the Grande Prairie Impact Area was experiencing significant increases in population. This was in spite of the fact that the Peace Region as a whole was experiencing a declining share of Alberta's growing population.[13]

Within the Grande Prairie Impact Area, population increased by 72% between 1951 and 1971, or from 14,127 to 24,348 persons. This percentage increase was significantly above the average for the Peace Region of Alberta which was 53%, but it was just below the provincial average of 73%. These data indicate that while the Grande Prairie Impact Area was outstanding as a rapidly growing one within the Peace Region, from a provincial point of view, the area's population growth rate was just about par with most other areas in Alberta.

13/ Between 1951 and 1981, the population of the Peace Region (Census Division 15) as a percentage of the Provincial total dropped from 6.5% to 5.74%.

Analysis of historical growth patterns shows that in spite of the overall trend of a large secular increase in population in the Grande Prairie Impact Area, there have been wide fluctuations in population growth. The data in Table 3.1. show that the years 1951 to 1956 were significant growth years while 1956 to 1961 were years when population growth was most curtailed. The five years prior to the establishment of the mill (1966 - 1971) were also a period of substantial decrease in the rate of population growth indicating most likely a slowing down in local economic growth.

Table 3.1.

HISTORICAL POPULATION GROWTH
GRANDE PRAIRIE IMPACT AREA

Year	Population	5-Year Increase	Average Annual Percentage Growth 14/
1951	14,127	-	
1956	19,087	4,960	6.00
1961	19,335	248	0.25
1966	22,432	3,097	2.96
1971	24,348	1,916	1.63
1976	29,842	5,494	4.00
1981	41,266	11,424	6.47
1986	43,455	2,189	1.03

Source: Statistics Canada

14/ The growth rates refer to the preceding intercensal periods.

In the Peace River Impact Area, during the two decades prior to the arrival of the pulp mill, population also increased significantly but at a much slower rate than was the case in the Grande Prairie Impact Area. According to the data in Table 3.2, population increased by 33% between 1966 and 1986, or from 12,824 to 17,120. This percentage increase was well below the average for the Peace Region as a whole and also below that of the Provincial average. Since the 1976 -1981 period when the area experienced significant increases in population as a result of oil and gas exploration and drilling in the area, growth has been particularly slow reflecting a general weakening of the economy of the Impact Area.

Table 3.2.

HISTORICAL POPULATION GROWTH
PEACE RIVER IMPACT AREA

Year	Population	5-Year Increase	Average Annual Percentage Growth
1966	12,824	-	-
1971	13,414	590	0.89
1976	12,989	(425)	(0.64)
1981	16,397	3,408	4.65
1986	17,120	723	0.86

Source: Statistics Canada

Notwithstanding the fluctuations in population growth witnessed in the two Impact Areas, the substantial increase in population experienced in both areas, particularly the Grande Prairie Impact Area, is clear evidence that these areas had already acquired some growth momentum of their own even before the mills were established within their boundaries. This is an important observation because it underlies one of the central arguments in this thesis that although pulp mill development played an important role in the growth of the City of Grande Prairie, other equally powerful forces were concurrently exercising their influence on the impact area.

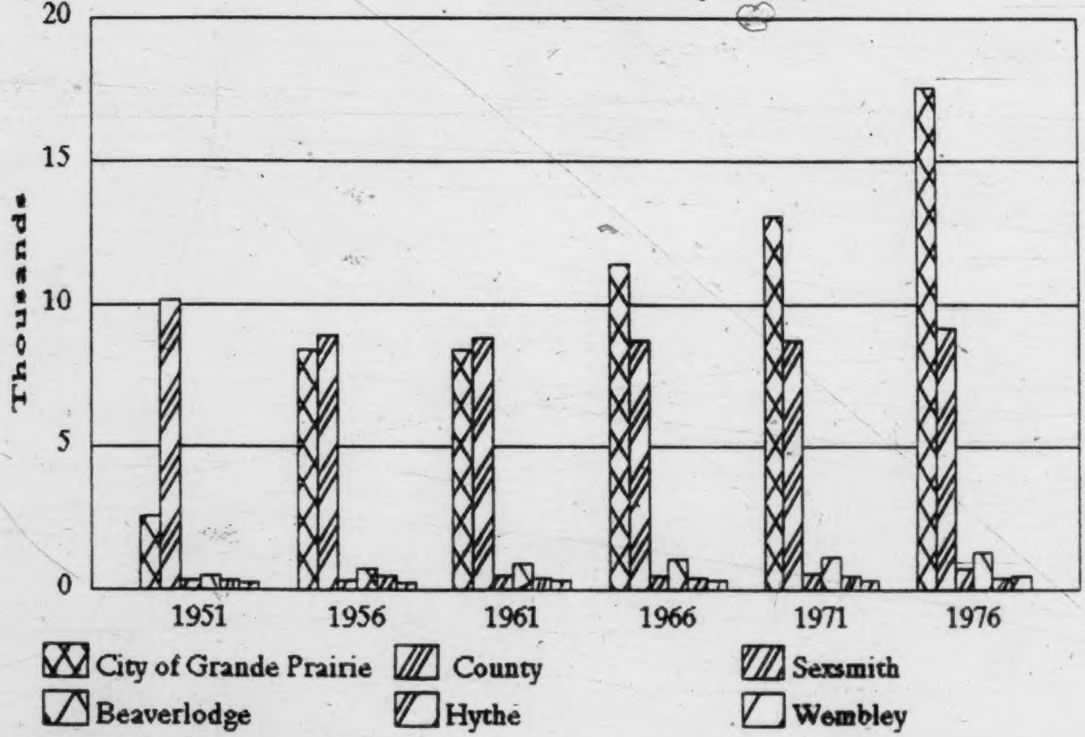
These concurrent forces are recognised primarily as intra-regional rural-urban migration in the Peace Region, other resource development activities in the Peace Region, and urban development in the City of Grande Prairie. It is the combined effect of these various influences that is recognised as the reason for the even faster growth of the City of Grande Prairie after the arrival of the mill. This is contrary to the popular view that exists in the Grande Prairie area that the Proctor and Gamble mill was responsible for the City's "take off" in the early 1970s.

Baseline Population Distribution

Figure 3.1. graphically highlights population distribution in the Grande Prairie Impact Area during the baseline and impact periods. The graph shows that up to the 1961 Census, the County of Grande Prairie, which eventually hosted the mill, contained the largest number of people in the Impact Area. However, from 1965 the County began losing population and by 1971, it had already lost its status of having the largest share of the impact area's population to the City of Grande Prairie. At the time construction commenced on the Proctor and Gamble mill, the County was now beginning to show signs of an increase in population.

Among the adjacent municipalities, the graph shows that the number of persons living in the small towns throughout the baseline period was particularly small in comparison to the City and County of Grande Prairie. Population growth during the two decades prior to the establishment of the mill was also very minimal. In Beaverlodge, population increased by only 641 and in the other towns, it was even smaller. Sexsmith grew by 264 persons while Hythe and Wembley grew by only 143 and 101 respectively.

Figure 3.1. **Baseline Population Distribution**
Grande Prairie Impact Area



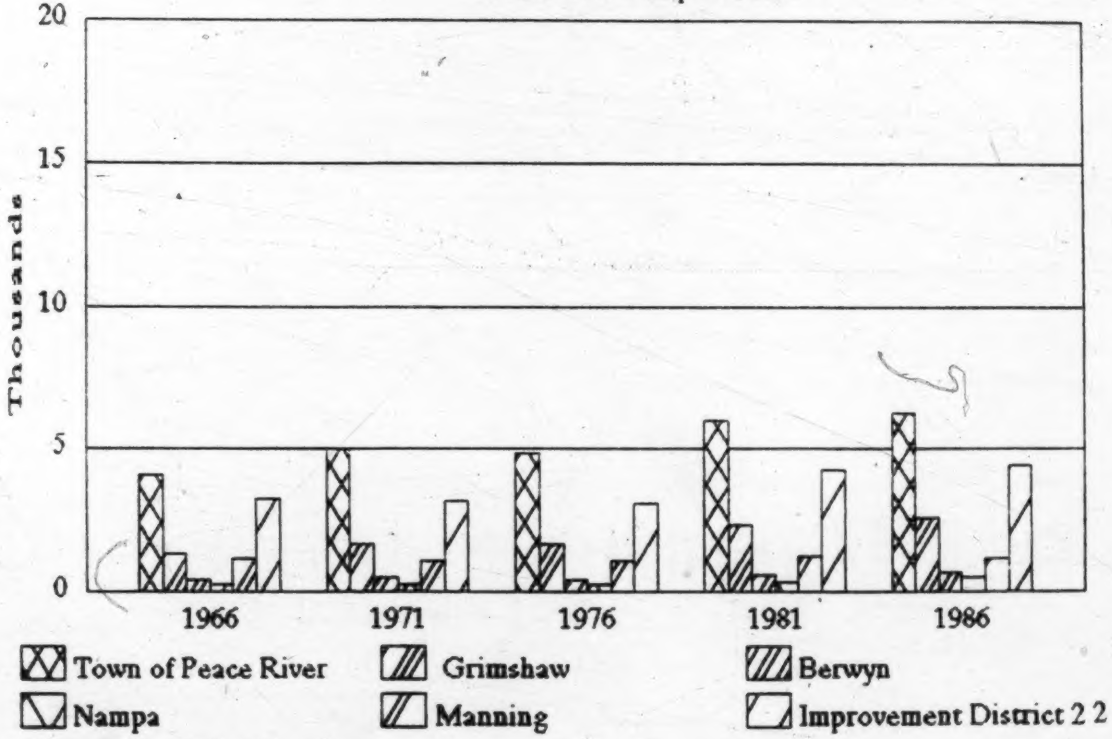
Source: Statistics Canada

In the City of Grande Prairie, the largest urban centre in the impact area, population growth was greater than the combined total experienced elsewhere in the Impact Area. Between 1951 and 1971, population in the City alone increased by 10,511 or nine times the amount experienced elsewhere in the incorporated areas of the Impact Area. The City of Grande Prairie was thus by far, the most vigorous growth point in the Impact Area prior to the arrival of the mill.

In the Peace River Impact Area, the basic population distribution pattern over time was relatively similar to that in the Grande Prairie Impact Area (Figure 3.2). However, in this case, the host municipality, Improvement District 22, was gaining population in the two decades prior to the arrival of the pulp mill. During that period, the Improvement District experienced a net increase of 1,214 persons, this being indicative of the large amount of resource exploitation activities taking place in the area.

Among the adjacent municipalities, growth was once again concentrated in the largest urban centre. During the baseline period, 1966 to 1986, the town of Peace River experienced a net increase in population of 2,203 persons. This compares with an increase of 1,119 in Grimshaw, 235 in Berwyn and 177

Figure 3.2 Baseline Population Distribution
Peace River Impact Area



Source: Statistics Canada

in Nampa. Two areas, Manning and Municipal District 135 lost 39 and 693 persons respectively.

The reasons for the similarity in the basic distribution patterns over time within the two impact areas lie in the long term changes that were taking place in the spatial distribution of population in Alberta as the province moved from a rural-based agriculture dominated economy to an urban-based service economy. In the rural areas, modernization in agriculture led to a decrease in the demand for farm labour and a consequent out-migration of people from rural communities and small towns whose economic bases were being eroded as they lost their importance as agricultural service centres. At the same time, the large and medium-sized urban centres, became major destinations for rural migrants because of opportunities for obtaining jobs in the rapidly developing manufacturing and service sectors of these centres. These factors account for the small population in the towns and the dominance of the City of Grande Prairie and the town of Peace River.

But rapid population growth in the two main urban centres, particularly Grande Prairie, was also a result of migration from elsewhere in Alberta. This migration was occasioned by a resurgence in resource development activity in northern

Alberta beginning from the early 1960's. Smith (1982) observes that the resurgence in resource development efforts was a response to upturns in demand in the international market place for many of the resources that the region possessed. Thus, in the two decades prior to 1971, while agriculture continued to be the mainstay of the economy of much of the Peace Region, significant increases in exploratory and development work were witnessed in the oil and gas sector, the forestry and coal sectors, and in transportation.[15/] The resurgence of efforts in resource development in northern Alberta produced a counter-current of people moving into the region, most of whom settled in the larger urban centres such as Grande Prairie and Peace River where greater emphasis was being placed on the development of urban infrastructure and municipal services.

[15/] See P.J. Smith, "Alberta Since 1945: The Maturing Settlement System" in A Geography of Canada. Heartland and Hinterland. (Ed) L.D. McCann, Prentice-Hall, 1982.

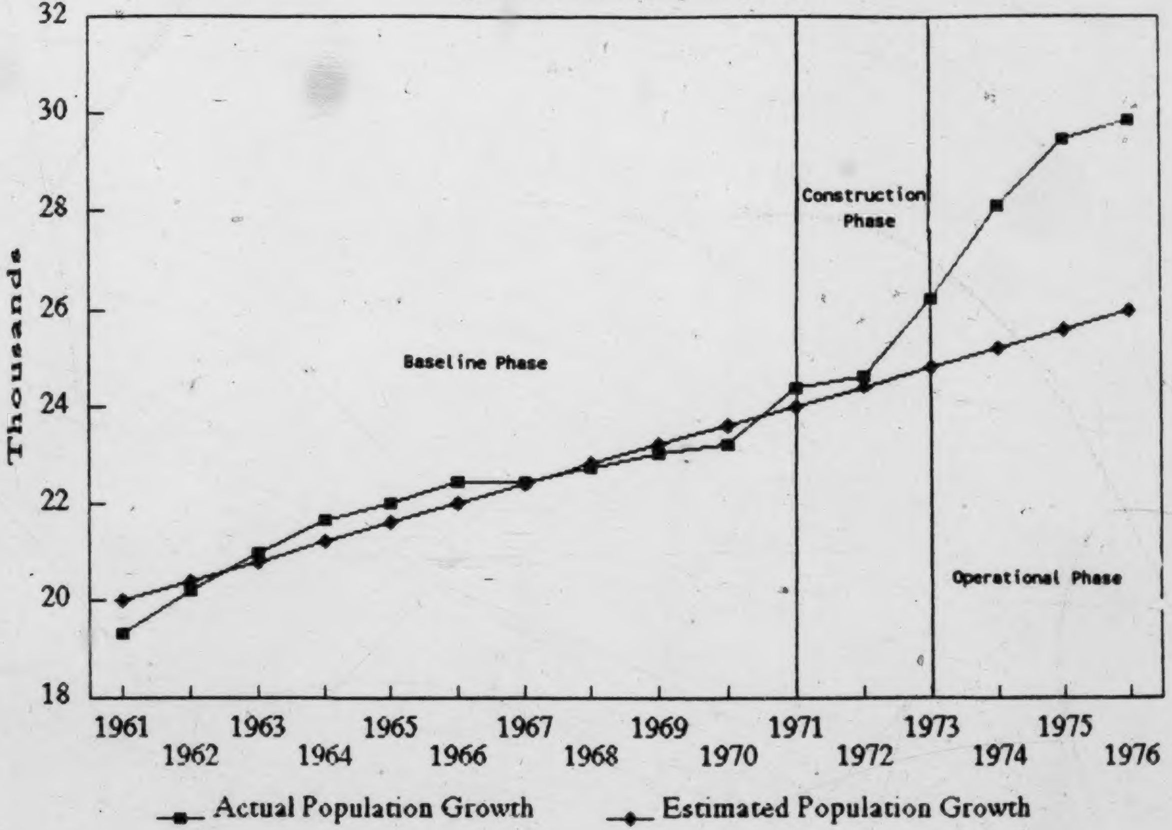
3.2. Impact of Pulp Mills on Population Growth

The data on population change following the establishment of the pulp mills reveal startling differences in the level of growth experienced in the two impact areas. While the Grande Prairie Impact Area experienced a sudden, large increase in population during the evaluation period, the Peace River Impact Area has not manifested these characteristics to any significant degree indicating that not all large scale projects have similar demographic effects.

Between 1966 and 1971, the average population growth rate in the Grande Prairie Impact Area was 1.63% per annum (Table 3.1). During the following five year period, the growth rate increased dramatically, moving to an average of 4.0% per annum. In absolute terms, this meant that 5,494 persons were added to the impact area's population between 1971 and 1976. This compares with just 1,916 persons that were added to the population during the preceding five years. This large variation from baseline trends is shown graphically in Figure 3.3.

The contribution of the Proctor and Gamble pulp mill to total population growth between 1971 and 1976 was determined indirectly by estimating the population that might have

Figure 3.3 Estimated and Actual Population Growth, 1961 – 1976
Grande Prairie Impact Area



existed been had there been no pulp mill. The difference between this total and the actual population that existed is attributed to the mill, providing that no other explanatory variable can be found. Simple regression analysis was used to estimate the counterfactual population, that is, the population without the influence of the pulp mill. Population data for ten years prior to the arrival of the mill was used to construct the regression equation which was then used to estimate population increases during the evaluation period. The regression output is shown in Appendix Three. However, Figure 3.3 presents the graph of the equation. For the construction phase of the Proctor and Gamble mill, population was estimated to grow from 23,997 in 1971 to 24,797 in 1973, a total increase of 800 persons. As can be seen, these estimates are well below the actual population in 1971 which was 24,353 and the actual population in 1973 which was 26,215. The actual increase between 1971 and 1973 was 1,862 persons.

For the early operational phase of the Proctor and Gamble mill (1973 to 1976), population was estimated to grow from 24,797 persons to 25,996 persons assuming that there were no pulp mill established in the area. This is an increase of 1,199 persons. In actual fact, population rose from 26,215 to 29,842, an increase of 3,627. For the entire evaluation period, the actual population increase exceeded the forecasted increase by a total of 3,490 persons.

The crucial analytical question that remains, however, is whether this additional 3,490 persons could have been added to the impact area's population solely because of the pulp mill. Based on the analysis below, it is concluded that the pulp mill, at least during its operational phase, may have only been singularly responsible for less than half of the population increase.

An estimate of the contribution of the pulp mill to population growth during the construction phase of the mill could not be determined because there are no data available on the number of migrant workers who lived in work camps and those who lived in the City of Grande Prairie and the other municipalities within the impact area. No statement can thus be made in this analysis on the extent to which the pulp mill contributed to the above normal increase of 1,062 persons and to what extent did other factors contribute to this increase.

Regarding the operational phase of the mill, if the 1976 workforce of 795 workers could be taken as a typical year's direct employment level for those early post-construction years, then an estimate could be made of the increase in population caused directly by the mill during 1973 and 1976. The estimate depends on some important assumptions: that about 38% of the operational workforce were recruited from outside the Grande Prairie area[16/]; that 80% of migrant workers were married[17/] ; and that the average family size associated with these workers was 2.4.[18/] On the basis of these

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[16/] In the absence of reliable data, an estimate of 38% of the total operating workforce was assumed to be migrant workers. This percentage reflects the average found to be associated with many large-scale projects in several western American states (Leistritz et. al. 1982:30). Such low values have been the result of explicit policy by resource companies to emphasize local hiring to build stable workforce. This was also the policy of the Proctor and Gamble mill in Grande Prairie.

The Simon' (1988) Impact Assessment for Daishowa Canada had estimated that between 70% and 75% of the operational workforce would be in-migrant workers. These figures are almost double the average of 38% used for the American projects and are now realized to have been too high. Statistics obtained from Daishowa Canada in September 1990 indicated that of the first 289 workers employed by Daishowa, 55% were migrant workers. This is much closer to the findings from the American surveys, and also to observations made by local municipal officials in 1991 that migrant workers probably accounts for 40% of the total operational workforce. Over-estimation of the migrant workers' component could be extremely costly as reflected in the over-building in the construction sector in Peace River in the 1988-89 period.

[17/] This percentage reflects the average for most large-scale projects in northern Alberta. See H.A. Simon, Environmental Assessment Report - Daishowa Canada Ltd. 1988, pp. 6-37.

[18/] Workers are assumed to have come from a random distribution of places in Alberta hence the provincial average from the 1976 Census was used to.

assumptions, it is estimated that about 643 persons (workers and family members) moved to the study area between 1973 and 1976 because of reasons directly related to the pulp mill. This represents 17% of the above normal increase between 1973 and 1976. When the multiplier effect of the mill is taken into consideration, an additional 159 to 238 jobs are involved.[19/] In estimating increased population from secondary job creation, difficult methodological problems arise and there is no way of determining this without extensive surveys. Past ex-post evaluations also do not offer much guidance since the tendency has been simply to avoid this issue or to assume that most of the secondary jobs go to local personnel.

In the absence of any data, the number and characteristics assumed for migrant workers directly employed by the mill is also assumed for secondary migrant workers. This gives a total of 128 to 192 additional persons moving into the impact area. Altogether, approximately 771 to 835 persons can be attributed singularly to the pulp mill. This is 22 - 24% of the above normal increase experienced during the period.

19/ See pg 87.

The above findings suggest that although the Proctor and Gamble pulp mill was a major stimulus to population growth in the Grande Prairie Impact Area during 1971 and 1976, the mill alone cannot account for the very large increase in population in that area. Based on the trends observed in the baseline period, it could only be conclude that the majority of persons moved to the Impact Area to participate in the general growth of the City of Grande Prairie. This growth, as explained earlier, was occasioned by the changes in the agriculture sector which forced people to migrate from the farmlands, the opportunities for employment created as a result of urban development, and the central role that the City plays as a transportation centre and as an agriculture and resource development service centre in Northern Alberta.

In the case of the Peace River Impact Area, due to the recency of the Daishowa mill, impacts were only considered for the construction phase of that mill, that is, the period from 1988 to 1990. According to population forecasts by H.A. Simon's Consultancy for Daishowa Canada Ltd., without the pulp mill the Peace River Impact Area should have increased its population by about 503 persons during the construction phase of the mill. With the pulp mill, the population was estimated to increase from 19,978 to 22,336, a total of 2,358 persons.[20] The town of Peace River alone was expected to increase its population by 163 persons without the pulp mill, and by 1,220 persons with the pulp mill. These estimates took into consideration the fact that the construction workforce would live mostly on workcamps situated some distance away from the settled areas.

According to municipal census data for 1988 and 1990, population in the town of Peace River, where most of the additional population were expected to reside, increased by only 89 persons between 1988 and 1990.[21] This is just 7.3% of the expected increase and compares very weakly with the total of 1,862 persons who were added to the City of Grande Prairie's population during the construction phase of the Proctor and Gamble mill. The small increase in the town of Peace River's population is particularly surprising since it includes natural increase, normal migration to the town of Peace River, plus migration of some construction phase workers and in some cases, their families.

20/ H.A. Simons Ltd., ibid. pp. 6 - 50.

21/ Municipal Censuses, 1988 and 1989, Town of Peace River.

Given the preference of migrant construction workers to live in larger urban centres and also the fact that only a small increase was experienced by the main urban centre, the town of Peace River, it is not inappropriate to assume that the other municipalities may have only experienced inconsequential increases in their population as a result of the mill during its construction and early operational phases.[22] Since annual population censuses are not done for the smaller municipalities, the exact picture of what happened will emerge only after the results of the 1991 federal census results are published. In the meantime, the general impression of local officials is that the Peace River Impact Area has not experienced substantial population growth following the construction of the pulp mill.

In terms of an explanation of the limited growth that occurred in the town of Peace River during the construction phase of the mill, it seems probable that the high unemployment levels that existed in the town just prior to the commencement of construction activities may have played a critical role in reducing the large number of persons who might have been

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22/ This was later confirmed through interviews with local municipal officials.

otherwise attracted to the area.[23] High unemployment may have been also responsible for out-migration from the area just prior to the arrival of the mill. High levels of unemployment became problematic between 1981 and 1986 and this situation was further exacerbated in 1988 with the closure of a number of companies that were longtime corporate citizens of the area. This created an even larger pool of unemployed persons in the labour force who, most local officials agree, were the first to take advantage of job opportunities in the service and retail sectors that were indirectly created by the mill.[24]

In addition to the above reason, it is felt that the large number of construction workers who lived on the work-site was very decisive factor in restricting growth in the town. This was compounded by the fact company arrangements allowed most of their basic needs to be supplied without them having to interact much with the business sector in the town. Altogether, this resulted in a limited expansion of retail and

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23/ The 1986 census placed unemployment at 9.7%. Although there are no intercensal data on unemployment rates, there is no reason to believe that the unemployment rate actually declined between 1986 and 1988 since there was no upsurge in local economic activities.

24/ Discussion with local officials including R.D. Roycroft, Director of Operations, Town of Peace River, and Rodger Cole, Regional Business Counsellor, Economic Development and Trade, Peace River Alberta.

services businesses. Fewer jobs were thus created thereby reducing the possibility of attracting large population increases.

Notwithstanding the limited population increases during the construction phase of the mill, it may be that the Peace River Impact Area will experience a much larger increase in population during the operational phase of the mill. This occurred in the case of Grande Prairie and resulted from the fact that operational phase migrant workers, lived in the urban centres thereby adding to overall population growth. It is also possible that the multiplier effect of increased household expenditure may induce some amount of growth in the local economy and this could stimulate some in-migration of population.

3.3. Distribution of Population Growth Among Host and Adjacent Municipalities

Examination of data on the spatial distribution of population within the impact areas shows that the two host municipalities did not attract a relatively large amount of people to settle in their jurisdictions following the establishment of the pulp mills. In the Grande Prairie Impact Area, the data show that the host municipality, the County of Grande Prairie, only experienced a total increase of 425 persons between 1971 and 1976. This represented just 6.4% of the total increase in the Impact Area during the same period. In Improvement District 22, it is still not clear by how much the population has increased during the construction phase of the mill, but the total increase is expected to be substantially smaller than what was experienced in the town of Peace River.

A limited increase in population in the host municipalities is not surprising as these are rural municipalities with relatively few residential facilities to accommodate a large migrant population. This itself is reflective of the fact that rural municipalities are generally precluded by land-use plans, agreed upon by Regional Planning Commissions, to prevent intensive residential development. This is considered urban land use and planning policies direct such development to urban areas.[25/]

Similar to the host municipalities, the small towns also did not show any significant increase in population. This was clearly seen, for example, in the case of the Grande Prairie Impact Area (See Figure 3.1).

[25/] See Peace River Regional Planning Commission, Patterns For the Future, A Regional Policy Plan for the Peace River Region of Alberta, 1976.

That migrant workers to non-metropolitan areas prefer to live in the larger urban centres is borne out by the large population increase experienced by the City of Grande Prairie relative to other communities. In the City of Grande Prairie alone population increased by a remarkable 4,551 persons or 83% of all the increase in the Impact Area between 1971 and 1976.

The important lesson that emerges from the case studies is that small communities, including small towns, that are within commuting distance to larger urban centres should not be too optimistic about population increases from large projects locating in the settlement system of which they are a part. This is because migrant workers prefer to live mostly in nearby urban centres that offer better access to housing, recreational facilities, schools and other community facilities. Smaller municipalities should therefore exercise caution in investing in public infrastructure in anticipation of large population increases.

Changing lifestyles and the way in which people relate to the physical environment may nevertheless affect future residential patterns of migrant workers. If certain areas within commuting distance are perceived to be attractive for residential purposes, then they may begin to benefit from residential growth caused by people who prefer to live outside the urban centres but close enough to take advantage of the amenities of the city. Perhaps, it is for this reason that centres such as Sexsmith and Wembley have not declined, and that acreage development has increased in the County of Grande Prairie.

3.4. Conclusion

At the level of the Impact Areas as a whole, the conventional view that large-scale industrial development in non-metropolitan areas is accompanied by substantial population increase has been moderately substantiated in the case of Grande Prairie but not in Peace River. The lack of a larger amount of growth in the Peace River Impact Area during the construction phase of the Daishowa mill highlights the point that the migration factor does not always operate with the same amount of intensity everywhere, particularly if there are relatively high levels of unemployment which may have caused preceding out-migration.

Notwithstanding the observation noted above, a much disputed issue is what level of growth should be regarded as substantial. Murdock et al (1982) have suggested that an annual growth rate of 10% and beyond represents boomtown growth levels, but they have observed that such growth levels only occur rarely. In their review of 83 impacted communities in the United States, Murdock and his colleagues note that over 50% of the communities experienced annual growth rates of less than 5%; 21% experienced rates of between 5 - 10 %; and the remainder experienced rates above 10%.

If these figures can be used as a guide, then it is evident that the Grande Prairie Impact Area with an annual growth rate of 4% in the first five years since construction began on the mill, experienced a growth rate that is quite typical for most communities though it was still far from boomtown levels. In view of the problems caused by annual growth rates of 10% and above, such a level of growth may have been appropriate for the efficient and orderly development of the City of Grande Prairie.

In the Peace River Impact Area, the lack of any significant increase in population is disappointing but not entirely unusual. In their study, Murdock and his colleagues found that of the 50% of the impacted communities in the United States which experienced population growth of less than 5% following a large-scale project, just under half had experienced growth levels of less than 2% per annum.

Population growth is thus clearly not automatic following the development of large resource industries in frontier regions and this has been exemplified in the Peace River Impact Area.

As regards the distribution of population growth within the impact areas, the empirical evidence gathered for this thesis suggests that if the project is located within an established system of settlements, the rural communities and small towns are least likely to benefit from population increase. There is a definite urban-bias in migrant workers' choice of residence. This stems from the fact that modern resource development requires highly skilled personnel and the level of urban amenities that are accessible to these workers in non-metropolitan communities is a critical factor in retaining their skills. Ultimately then, large industrial developments in non-metropolitan areas may be a catalyst for concentrating rural population into medium-sized urban centres.

CHAPTER FOUR

4.0. ECONOMIC IMPACTS OF PULP MILLS ON THE GRANDE PRAIRIE AND PEACE RIVER IMPACT AREAS

In this Chapter an analysis is made of the impact of the pulp mills on the process of economic development in the municipalities that make up the Grande Prairie and Peace River Impact Areas. The objective is to determine whether the pulp mills have in any way altered the structural economic relationships within the local economies, and whether in so doing, they have enhanced the community's potential for long term economic growth. The Chapter also seeks to measure, in quantitative terms, the contribution of the pulp mills to increased performance of the local economies, and hence, to improvement in economic welfare.

4.1. Baseline Economic Development Processes

Economic Base Theory

This part of the analysis makes use of export base theory to study the process of economic development in the various communities that make up the impact areas. It is recognised that the export base theory does not entirely explain the development process in these communities, as indeed no single theory does. However, this theory has been chosen because some of its relationships are useful for understanding development in small relatively undiversified, non-metropolitan economies (Shaffer, 1989).

Export base theory explains long-term economic development from the point of view of export demand. In instances where a continued high level of external demand exists for a community's output, opportunities are created for the long term employment of local labour and capital. The income earned from goods and services sold outside the geographical boundaries of the community flows into the community and is translated into development impulses via linkages between the export sector and the residentiary or non-basic sector. The process of long term development depends on the community being able to maintain its comparative advantage over other communities in the supply of particular export products from which it derives its main source of income.

Long term decline, on the other hand, occurs where a community experiences a continued decline in the volume of its exports and loses the comparative advantage of its export products. This may occur for a number of reasons including a shift in external demand, or technological improvements in other communities that produce the same goods for exports. The loss of comparative advantage results in unemployment of factors of production and low income, first, in the export sector of the community, and them eventually in the residentiary sectors. If the process is not arrested early enough, long term community decline occurs.

Community Economic Development in Impact Areas - Baseline Period

The economies of the municipalities that compose the two impact areas were divided into three groups to illustrate the process of economic development in the various types of municipalities. The first group is made up of the two rural economies that host the pulp mills, the County of Grande Prairie and Improvement District 22. Also included in this group is the only other rural municipality in the study areas, Municipal District 135. The second group consists of the small "country towns" or agricultural service centres such as Grimshaw, Sexsmith, Beaverlodge, Wembley, Hythe, Nampa, and Berwyn. In the third group is found the two medium-sized retail and service economies of the City of Grande Prairie and the town of Peace River.

The economy of the first group, the rural municipalities, has been traditionally based on the exploitation of primary resources. During the 1960s, the sustained demand for primary products such as oil and natural gas, timber and agriculture products provided these municipalities with a relatively strong export base. However, their residentiary or non-basic sector remained weak and undeveloped on account of the small and dispersed nature of their population, and also due to the fact that, except for the agriculture sector, only a small amount of the communities' export earnings find their way back into the local economies. Whether the arrival of the pulp mills helped in any way to strengthen the domestic sector of these municipalities will be examined later in the Section.

The smaller agricultural service centres since the 1960's have experienced economic changes leading to either gradual decline or moderate growth in the size of their traditional export base - their retail and agriculture services enterprises. For those centres which have experienced decline, the primary reason for this has been the loss of business from farmers and the small amount of business from the local non-farm population. Both groups prefer to travel longer distances to the larger towns and cities such as Grande Prairie and Peace

River or even Edmonton to obtain goods and services.[26/] To the extent that the smaller centres have not retained their retail and service businesses, they have lost their export functions and have suffered decline.

In the small urban centres which showed some economic growth, this was due to them being outside the dominant trade area of the large urban centre, for example, Manning. In other cases, for example, Grimshaw, growth has occurred because the centre has been able to retain its retail, service and transportation functions even in the face of competition from the nearby larger town of Peace River. In the case of Beaverlodge, growth was the result of it being the only centre in the south western part of the Peace Region, between Grande Prairie and British Columbia, where higher level government services were offered.

Unlike the smaller towns which have largely experienced economic difficulty since the late 1950's, the City of Grande Prairie and the town of Peace River have enjoyed not only a greater differentiated economic structure than the smaller municipalities in group two but also increasing comparative

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[26/] Research and Planning Division, Human Resources Development Authority, The B - 15 Plan. An Outline for Rural Development in Alberta's Census Division 15. Government of Alberta, Edmonton, 1969 advantage in the supply of retail goods and services to other municipalities. These centres have thus emerged as the two highest order urban places in the Peace Region specializing in the supply of commercial, financial, educational, medical, and governmental services at higher levels of sophistication, and at a greater degree of variety than the surrounding municipalities (Webster, 1971). This in turn has guaranteed their export base since both centres serve the entire subregion of which they are a part.

4.2. Impact of Pulp Mills on the Process of Economic Development

Analysis of various records indicates that the establishment of the pulp mills have had different effects on the process of economic development in the three types of municipalities identified in the impact areas. Also there have been differential effects within each group.

Within the two rural host municipalities and also in the other rural municipality, Municipal District 135, the effects of the mills, as expected, have been to strengthen their export sector in the areas of manufacturing and forestry. Also existing linkages between the forestry and wood processing sector have been strengthened and the quality of certain public infrastructure, particularly roads has been improved. But it is difficult to imagine that major improvements have occurred in the balance of payments of these economies since outside of wages, only a limited amount of export earnings have entered into their income circuits from pulp mill development. Also, because population growth in these municipalities is limited, their previously undeveloped residentiary sectors have had little opportunity to expand.

With respect to the smaller urban centres, it is noted that the presence of the mill in the area did not lead to the strengthening of their economic bases via increase purchases in the towns. This is reflected in the fact that most of them continued to lose retail and service businesses during 1971 and 1976 (Table 4.1). The reduction of commercial outlets suggests that residents of these communities did their shopping outside of their communities, most likely in the City of Grande Prairie or Edmonton. The loss of retail and services businesses to their competitors in the City of Grande Prairie meant that the export base of many of these communities continued to be systematically weakened and with this, some of their potential for long term development. This is in spite of the presence of the large-scale resource industry in their vicinity.

In the Peace River area, the mill has been in operation for less than one year now. Thus, it is still too early to evaluate the impact which it has had on the process of economic development in the small towns. Nevertheless, it is hardly likely that substantial improvements will occur both in the residentiary sector and export base of the towns.

Analysis of the impacts of the mills on the process of economic development in the two large urban centres show that the presence of the mill in the Grande Prairie areas has had the direct effect of expanding the number of businesses in both the regional export and domestic sectors of Grande Prairie's economy. In Peace River, the mill seems to have had only a limited effect on the domestic sector.

In accordance with export base theory, the impetus to Grande Prairie's economy came from expansion of the residentiary sector which in turn was stimulated by the large population increases within the City during the evaluation period. Expansion of the residentiary sector occurred in the form of new retail and commercial businesses. This is reflected in the data in Table 4.1 where the number of retail and service outlets increased from 157 in 1971 to 269 in 1977. This represents 99% of all such increase in the entire impact area during that period. The expansion in the residentiary sector is also reflected in building permit data for the same period which show large increases for commercial, residential, and institutional buildings (Table 4.2).

Table 4.1.

NUMBER OF RETAIL AND SERVICE OUTLETS
GRANDE PRAIRIE IMPACT AREA, 1971 and 1977

Municipality	1971			1977		
	Retail	Service	Total	Retail	Service	Total
City of Grande Prairie	126	31	157	182	87	269
Beaverlodge	23	7	30	20	11	31
Sexsmith	13	13	26	12	2	14
Hythe	-	-	9	4	3	7
Wembley	13	4	17	10	6	16

Source: Alberta Treasury, Bureau of Statistics. Retail and Service Trade Statistics, 1971 and 1977

Table 4.2.

Value of Building Permits, 1965 - 1976
City of Grande Prairie

Year	R\dential	C\mercial	Indus.	Instit.	Other	Total
			$'000			
1965	1,317	772	53	810	111	3,063
1966	141	281	32	2,009	304	2,767
1967	1,017	525	50	377	135	2,104
1968	1,962	483	NA	2,518	425	5,388
1969	1,687	937	256	470	2	3,352
1970	1,511	851	223	275	0	2,860
1971	5,059	2,216	248	388	148	8,059
1972	9,782	2,922	312	1,700	286	15,002
1973	7,628	4,942	300	5,462	241	18,573
1974	7,310	5,706	806	2,880	407	17,109
1975	7,484	1,663	0	2,629	732	12,508
1976	10,294	3,052	462	1,515	667	15,990

Source: City of Grande Prairie

The precise linkage between the mill and the development of specific business enterprises cannot be established from available data. However, the growth in the residentiary sector led to the general reinforcement of the city's position as a provider of higher order urban services. This in turn strengthened the City's capacity to supply its trade area with a wider variety of goods and services thereby expanding its export earning capability and its long tern economic development potential.

In the town of Peace River, it is arguable whether there has been any significant acceleration in the process of economic development since 1988 when construction of the pulp mill began. The town did not experience an increase in population comparable to the City of Grande Prairie. Consequently, there was little incentive for entrepreneurs to expand their businesses. This is substantiated from the data in Table 4.3. which shows that the value of building permits for commercial and industrial development did not rise significantly during the evaluation period. For the most part, the increase in the total annual value of building permits was the result of much activity in the construction of dwelling places. Unfortunately, much of this was due to over-estimation of new population. Whatever economic stimulus that was provided by

Table 4.3.

Value of Building Permits,
Town of Peace River, 1982 - 1990

Year	Residential	Commercial	Indust.	Instit.	Others	Total
		$ '000				
1982	1,487	1,156	0	246	202	3,091
1983	2,016	2,117	137	52	93	4,415
1984	5,063	2,126	1,281	748	74	9,292
1985	882	1,001	1,141	1,108	126	4,258
1986	950	2,114	308	0	116	3,488
1987	1,971	1,663	225	17	310	4,186
1988	3,233	6,529	1,365	5,006	194	16,327
1989	12,528	1,869	150	4,818	70	19,435
1990	3,570	2,851	12	5,717	545	12,695

Source: Town of Peace River.

the construction sector, it is apparent that most businesses reacted with caution, preferring to accommodate the new levels of demand by utilizing excess capacity. Overall, the rather limited expansion in the residentiary sector did not create the conditions for Peace River to capture a larger share of the regional market to supply goods and services. Thus, the benefits of this multiplier effect were not largely obtained.

The foregoing discussion has identified the larger urban centres as the main growth points in the space economy of the two Impact Areas. The location of large-scale pulp mills close to centres has certainly extended opportunities and welfare to them although they were already favoured by public and private investment and were sub-regional magnets for labour, financial services and industry. On the other hand, the existing economic structure of the small towns has not allowed them to participate in the economic benefits of this largely top down form of industrial development (Ironside and Fieguth, 1990) and they have remained largely on the periphery. In the rural municipalities, economic benefits have also been limited because unlike agriculture, returns from forestry and pulp milling are largely lost to these communities.

4.3. Baseline Levels of Economic Activity

The previous section has focused on the structure of the local economies and has provided insights into the process of economic change in the impact areas and the effects of the pulp mills on the process of this change. In this section, an attempt is made to present a quantitative measurement of changes in the levels of economic activity generated by the pulp mills. Various units to measure economic activity have been suggested in the local economic development literature. These include sales, value added, income and employment. In this study, employment and income are the units of measurement.

Employment

As a unit of measurement of economic activity, employment suffers from certain limitations. These include the fact that employment data does not necessarily reflect increased productivity and therefore increased output; the available data is usually a mixture of full time and part time employment as well as for different genders; and also that employment figures do not capture income flowing into a community from interests, dividends, social security, payments and pensions (Davis, 1976; Shaffer, 1989). In spite of its problems, employment is still a widely used indicator of economic activity primarily because data is easy to collect even at local levels, and also because the level of employment is still considered to largely reflect the health of an economy.

Baseline Employment Status of Labour Force

To trace the employment effects of the pulp mills, a baseline analysis was first done to establish the size of the labour force, and participation and unemployment rates in the impact areas prior to the arrival of the mills. This was followed by an estimation of additional direct and secondary employment created by the mills and a consideration of the effects this has had on the dynamics of the local labour market.

As mentioned in Chapter Two, baseline information for the period 1961 to 1971, on the employment status of the labour force could not be obtained for the Grande Prairie Impact Area, hence a complete baseline study could not be undertaken. However by examining data for 1971 and comparing it with similar data at the provincial level, one can obtain some appreciation of the labour force and employment status of the population prior to the arrival of the mill.

Table 4.4 is a summary of the employment status of the population for the Grande Prairie Impact Area for 1971. At first glance, it seems that at the end of 1971 the Grande Prairie Impact Area's economy provided slightly better employment opportunities than the provincial economy as a whole. This is reflected in the fact that the Impact Area possessed higher labour force participation rates for both males and females and also lower unemployment rates. These Census figures however, contain some construction phase employment and, as later analysis will show, were it not for this inclusion, the unemployment rates might have been higher than the provincial average prior to the arrival of the mill. In general, however, it is evident that the Grande Prairie Impact Area's economy was not experiencing major difficulties with unemployment prior to the establishment of the mill.

In the Peace River Impact Area, data availability prior to the arrival of the mill allows a better picture to be obtained of the baseline employment situation there. According to Table 4.5, between 1976 and 1986, labour force participation rates for males were also high for the Peace River Impact Area, ranging from 81.7% to 84.0%. This compares with the

Table 4.4.

EMPLOYMENT STATUS OF LABOUR FORCE GRANDE PRAIRIE IMPACT AREA, 1971	Impact Area	Alberta
Total Population	24,348	1,637,874
Population Age 15 years and over		
Male	8,670	565,015
Female	7,655	548,415
Total	16,325	1,113,430
Labour Force		
Male	7,170	455,080
Female	3,550	243,520
Total	10,720	698,600
Employed Persons		
Male	6,850	428,975
Female	3,320	225,010
Total	10,170	653,990
Unemployed Persons		
Male	310	26,105
Female	240	18,510
Total	550	44,610
Participation Rates		
Male	82.6	80.5
Female	46.3	44.4
Total	65.6	62.7
Unemployment Rates		
Male	4.4	5.7
Female	6.7	7.6
Total	5.2	6.3
Employed Labour Force as a percentage of total population	39.9	41.7

Source: Census of Canada

provincial average which ranged from 79.6 % to 82.7%. High male participation rates in both Impact Areas reflect the younger male population of northern Alberta.

Unlike the Grande Prairie Impact Area, female participation rates in the Peace River Impact Area were less than that of the provincial average reflecting the proportionately smaller service sector which traditionally employs a large number of females. According to table 4.5, between 1976 and 1986, the overall participation rate increased by 5.2% with the actual number of persons employed increasing by 2,120. This was 605 less than the increase in the size of the labour force. In effect, the labour force was growing much faster than the amount of jobs being created. This is reflected in the increase in the number of unemployed persons between 1981 and 1986 as well as in the dramatic rise in the rate of unemployment during this period.

During the intercensal period 1971 and 1976, the rate of unemployment increased only minimally from 3.7% to 3.9%, but between 1981 and 1986, the rate began to climb steadily, reaching a peak of 9.7% in 1986. To a large extent, the rapid rise in unemployment mirrored the recession that hit

Table 4.5.

EMPLOYMENT STATUS OF LABOUR FORCE PEACE RIVER IMPACT AREA

	1976	1981	1986
Total Population	12,989	16,397	17,120
Population 15 years and over			
Male	4,690	5,910	6,375
Female	4,275	5,365	5,760
Total	8,965	11,275	12,135
Labour Force			
Male	3,835	4,810	5,355
Female	2,235	2,735	3,500
Total	6,070	7,545	8,855
Employed Persons			
Male	3,705	4,600	4,865
Female	2,160	2,630	3,120
Total	5,865	7,230	7,985
Unemployed Persons			
Male	135	210	480
Female	90	80	380
Total	225	300	860
Participation Rates			
Male	81.7	81.3	84.0
Female	52.2	50.9	60.7
Total	67.7	66.9	72.9
Unemployment Rates			
Male	3.5	4.3	8.9
Female	4.0	3.2	10.8
Total	3.7	3.9	0.7
Employed Labour Force a % total population	45.1	44.0	46.6

Source: Census of Canada

the provincial economy in the mid 1980s. Given the realities of unemployment that existed at the end of 1986, the expectation was that the establishment of the Daishowa mill would have had the effect of stabilizing overall participation rates as well as reducing the level of unemployment in the area. The discussion below analyses the extent to which these expectations were attained in the Peace River Impact Area and also in the Grande Prairie Impact Area.

4.4. Impacts of Pulp Mills on the Level of Economic Activity

Direct Employment - Construction Phase

Between 1971 and 1973, Proctor and Gamble employed a peak construction work force of 1,800 workers to construct the mill and access road.[27/] This compares with a peak construction work force of 1,568 utilized to construct the Daishowa mill and other facilities.[28/]

[27/] Proctor and Gamble Cellulose, A Presentation to the Environmental Council of Alberta, pp. 5. (Undated)

[28/] H.A. Simons, ibid. pp. 6 - 25.

A breakdown of the construction workforce by trade for the Proctor and Gamble mill is not available, but if it is assumed that the type of skills required to build the two mills are the same, then an idea of the variety of skills needed can be gleaned from examining the workforce requirements of the Daishowa's mill. This is shown in Table 4.6. Significant in the Table is the fact that the variety of skilled labour that was required made up 70% of the labour demands. Past studies have shown that such large demands for highly skilled labour are usually impossible to supply from the local labour pool and have to be supplemented by migrant labour which tends to dominate. In the United States, results from a number of surveys have shown that approximately 60% of the construction phase workers on large-scale energy projects in non-metropolitan areas are usually skilled migrant workers.29/

Data for the migrant / non-migrant breakdown of construction workers are not available for the Proctor and Gamble mill but Daishowa Canada had projected that between 70- 75 % of its construction work force would have been migrant workers.30/ If this figure is used for the earlier Proctor and Gamble

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29/ Larry F. Leistritz, Steve Murdock and Arlen G. Leholm, "Local Economic Changes Associated with Rapid Growth" in Coping with Industrialization, Eds. Bruce A. Weber and Robert E.Howell, Westview Press, Boulder, Colorado

30/ H.A. Simons Ltd. ibid. pp. 6 - 36.

mill, then approximately 1,260 to 1,350 out of a total of 1,800 construction workers may have been recruited from outside the Grande Prairie Impact Area itself. Local recruitment is thus estimated at approximately 450 to 540.

Table 4.6.

DAISHOWA'S CONSTRUCTION BY SKILL TYPE

Skill Type	Persons
Supervisory\Support	64
Bricklayers	19
Carpenters	288
Masons	17
Electricians	119
Insulators	136
Labourers	390
Millwrights	119
Operating Engineers/Teamsters	17
Pipefitters	212
Others	192
TOTAL	1,590

Source: "Selected Major Industrial Project Profiles in the Edmonton Market Area", Edmonton Economic Development Authority, October , 1989.

The number of locally recruited persons seems quite small in comparison with the number of migrant workers. However, this estimate represents 81% to 91% of the total unemployed labour force for 1971 in the Grande Prairie Impact Area. Although not all those employed by the mill would have come from the ranks of the unemployed, the data suggest that some small communities do in fact derive substantial employment benefits from large resource projects. This is a keenly debated issue as elsewhere (for example, Ironside and Mellor, 1974) various criticisms have been levelled at the limited opportunities created for local personnel by large companies operating in remote areas.

For the Peace River Impact Area, an estimated 1,098 to 1,254 workers out of a total of 1,568 construction workers are estimated to have come from outside the impact area. This means that approximately 314 to 470 construction workers were locally recruited. Although the number of construction phase jobs going to local personnel represents a significant proportion of the number of unemployed persons in the 1986 census, it is noted that the impact on unemployment in the Peace River area has not been as significant as one might have expected. This is because during the construction phase of the pulp mill, a number of existing companies in Peace River closed operations for various business reasons. These companies included Scott National, Peace Trailer, and Caribou Construction Ltd.. Operations at the Shell Canada Pilot plant for oil sands recovery also ceased operation during 1989. Altogether, it is estimated that about 250 jobs were lost.[31]

If indeed, as suggested from discussions with local officials, that many of the retrenched workers found employment with Daishowa Canada Ltd., then the effect of the mill on local unemployment rates was only minimal. The main benefit of the mill then was that it served to stabilize unemployment levels at perhaps the pre-pulp mill level of slightly more than 9%. Had not the mill located there, unemployment would have substantially increased between 1988 and 1990.

Direct Employment - Operational Phase

During its early operational phase, a total of 795 were directly created by the Proctor and Gamble operations in the in the Grande Prairie Impact Area.[32] This compares with a total of 630 permanent jobs that will be created by the Daishowa mill when it becomes fully operational. Using an estimate of 38% of the operational phase jobs as going to

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31/ Discussion with R.D. Roycroft, Director of Operations, Town of Peace River.

32/ Correspondence from Proctor and Gamble Cellulose Ltd., Grande Prairie.

migrant workers[33], then an additional 302 persons may have been added to the employed labour force of Grande Prairie Impact Area from outside the study area.[34] On the other hand, this implies that some 493 local workers were employed by the Proctor and Gamble mill. In the Peace River Impact Area, an additional 240 persons may be added to the labour force from outside the impact area while some 390 jobs will become available to local persons.

The fact that about 62% of the operational phase work force in both mills are local workers is particularly significant. It indicates that greater employment opportunities were extended to local workers during the operational phase of resource projects than in the construction phase of the projects. It is noted however, that such large amounts of jobs delivered to local communities may only be possible where there is a commitment on the part of the resource company to employ local personnel. For both of the pulp mills, there were explicit policies in train to recruit as many local personnel as

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33/ See pg 50 for an explanation.

34/ Migrant workers represent additions to the labour force of the impact areas. With this comes the benefit of increased skills in the local municipalities along with increased income being generated and spent in the impact areas.

possible in order to stabilize the workforce.[35] Such policies not only benefit the resource company, but they also serve to integrate the company more fully into the economic structure of the local community thereby offering greater opportunities for local economic development. Where these policies do not exist, it is likely that more jobs will be captured by migrant workers.

Secondary Employment

The amount of secondary employment cannot be directly measured because of the difficulty of tracing such employment. However the employment multipliers of 1.2 and 1.3 which were selected to estimate secondary employment yielded an additional 159 to 238 permanent jobs in the Grande Prairie Impact Area and 126 to 189 permanent jobs in the Peace River Impact Area. The total increase in permanent jobs is shown in Figure 4.7.

The total number of jobs stimulated by the Proctor and Gamble pulp mill represents between 39% and 43% of the total increase in employment in the Grande Prairie Impact Area between 1971

35/ Discussion with Wayne Crouse, Public Relations Manager, Daishowa Canada Ltd. and A.J Trepanier, Organization Effectiveness Manager, Proctor and Gamble Co. Ltd.

and 1976. This indicates the significant contribution made by the mill to overall employment in that area. These calculations also substantiate the point that although the presence of the pulp mill contributed significantly to the rapid growth of Grande Prairie, other concomitant factors were also responsible for the sizeable employment generation, particularly in the City of Grande Prairie.

A similar comparison cannot be made for the Daishowa mill until employment data becomes available after the 1991 census. However, it is expected that the Daishowa mill would also have a similar effect on employment creation in the Peace River area since 1988.

Table 4.7.

TOTAL EMPLOYMENT CREATION IN IMPACT AREAS OPERATIONAL PHASE

Employment	Grande Prairie Impact Area	Peace River Impact Area
Direct	735	630
Secondary	159 - 238	126 - 189
Total	954 - 1033	756 - 819

4.5. Spatial Distribution of Employment Within Impact Areas

Ideally, the distribution of permanent employment gains by the various municipalities could be determined by perusing the employment register of the resource company. In fact this is precisely what is being done at present by consultants in the Peace River Impact Area in connection with the revenue sharing agreement between Improvement District 22 and the other municipalities. This information will be available shortly.

For the Grande Prairie Impact Area, company records pertaining to the location of workers' residences in the early 1970s are not available. Also detailed employment data for the 1960s are not available for Census Division 15. In the light of these data gaps, a simple comparison was made of the employment levels in the different municipalities before and after the project to see how employment gains were distributed within the Impact Area. No attempt is made to establish causality between the presence of the mill and the employment gains of the municipalities. Table 4.9 shows the changes in employment for municipalities in the Grande Prairie Impact Area between 1971 and 1976.

According to Table 4.8, out of a total of 3,350 additional persons that were employed between 1971 and 1976, 2,420 or 72%

lived in the City of Grande Prairie. Of the remainder, a total of 690 lived in the municipality that hosts the pulp mill while 240 lived in the three small towns. Without a baseline picture, it is difficult to determine deviation from any trend. But the clear pattern that emerges is that following the establishment of the mill, employment growth was experienced mostly in the largest urban place without any appreciable rise in the smaller municipalities. This is explained not only on account of the City's own previous growth momentum, but also by the fact that most migrant workers lived in the City of Grande Prairie and that the

Table 4.8.

SPATIAL DISTRIBUTION OF EMPLOYMENT, 1971-1976
GRANDE PRAIRIE IMPACT AREA

Municipality	1971	1976	Total Increase	% Distribution of Increase
County of Prairie	3,850	4,540	690	20.6
City of Grande Prairie	5,410	7,830	2,420	72.2
Beaverlodge	490	525	35	1.0
Sexsmith	170	310	140	4.2
Hythe	150	170	20	0.6
Wembley	100	145	45	1.3
TOTAL	10,170	13,520	3,350	99.9

Source : Census of Canada, 1971 and 1976.

multiplier effect was mostly experienced there. Altogether, the argument is sustained that smaller municipalities, with their lack of infrastructure, are least capable of translating impacts from large projects into development impulses. Thus, although they may be located near to a large project, they may not be in a position to benefit appreciably from such type of development.

Income

Direct Income

Direct income became available to the study areas from the following sources: wages and salary paid to workers; goods and services bought locally; and from taxes paid to the local public sector. Information on these income flows for the peak construction year and for a typical operational year was obtained from Proctor and Gamble and Daishowa Canada. This is shown in Table 4.9.

Of note in Table 4.9. is the fact that the capital costs of the mills have not been included as local injections. The reason for this is that most of the capital equipment of new industries are usually imported into non-metropolitan communities, thus providing few opportunities for money to flow into the local income circuit. In the context of this study, it is the city of Edmonton, and other eastern cities, including some in the United States or even Japan that may have benefitted from the majority of initial capital expenditure.

Table 4.9.

APPROXIMATE DIRECT INCOME FLOWING TO IMPACT AREAS

Income Source	Proctor & Gamble		Daishowa	
	1972	1976	1989	1990
	(million dollars)			
Tax Payments	0.4	1.5	-	0.9
Value of Goods and Services purchased locally	12.5	27.0	NA[a]	NA[a]
Average Yearly Payroll	12.0	18.0	21.5	22.0
TOTAL	24.9	46.5	21.5	22.9

(a) Data were not obtained for these categories, hence there is a certain amount of under-estimation for the Peace River Impact Area.

Source: Proctor and Gamble Ltd; Daishowa Canada Ltd.

Secondary Income

Secondary income was estimated using a multiplier of 1.2 as suggested by Mellor and Ironside (1978) (See Table 2.1.) Table 4.10 shows the approximate level of secondary income that was generated in the two Impact Areas.

Table 4.10.

Approximate Secondary Income Flowing to Impact Area (million dollars)

	Grande Prairie Impact Area	Peace River Impact Area
Construction Phase	4.98	4.3
Operational Phase	9.3	4.6

4.5. Conclusion

The foregoing analysis has shown that the two pulp mills generated an almost similar amount of employment and income in the two impact areas during the construction and operation phases. However, the actual amount of economic growth in the two study areas were very dissimilar. Whereas the economy of Grande Prairie Impact Area, and more particularly, the economy of the City of Grande Prairie, expanded considerably, no comparable expansion took place in the Peace River Impact Area.

In explaining this difference, the argument is advanced that the rapid growth in the Grande Prairie Impact Area was not only because of the presence of the pulp mill, but rather a continuation of the growth momentum it had experienced since the early 1960s. Much of the Impact Area's growth and particularly that of the City of Grande Prairie, may also be attributed to the central role it plays as a regional wholesale centre in the shipping of goods to the Northwest Territories and to Alaska.[36/] In addition, as the largest urban centre in northwestern Alberta, Grande Prairie was the natural recipient of a large amount of public and private investments during the early 1970's. While the town of Peace River did experience some growth in its baseline period, it is noted that, historically, the expansion of this town has been at a slower rate than the City of Grande Prairie. Thus even

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[36/] See The University of Alberta Management Advisory Institute, Grande Prairie Market Study. Draft Report. 1979. See also R.G. Ironside and Dale D.Peterson, Edmonton's Wholesale Relationships with Northwest Canada. Canadian Geographer, Vol 26, No 3, pp. 221

if there was no recession at the time when the Daishowa mill arrived, the other concurrent growth forces would not have been strong enough to result in growth levels comparable to that of Grande Prairie.

From a spatial perspective, it is evident that most of the local economic benefits of the pulp mills were experienced in the large urban places while the rural host municipalities and the adjacent smaller urban centres experienced only minimal benefits. This spatial concentration of the economic benefits means that the pulp mills have contributed to increased divergence in intra-regional income distribution and economic opportunities. This suggests that smaller urban municipalities and rural areas may well have to depend on other strategies for long term economic development since they cannot compete with the larger centres in translating impacts from large-scale resource developments into community development impacts.

CHAPTER FIVE

5.0. MUNICIPAL FINANCIAL IMPACTS OF PULP MILL DEVELOPMENT

The assumption that large-scale industrial development always produce considerable tax yields and thus permit a lowering of municipal costs and property tax rates is one of the primary reasons why municipal governments support the location of such development either within or near to their boundaries. Past experience has however shown that fiscal gains from industrial development do not appear automatically.[37] Instead, their appearance depend on the interplay of a number of critical variables. These include the choice of location of migrant workers, the cost of additional infrastructure and public services, the level of revenue resulting from corporate taxes and related residential, commercial and industrial taxes, and possible tax base or revenue sharing agreements.

This Chapter analyses the impact of the Proctor and Gamble and Daishowa pulp mills on municipal finances by studying movements in certain key fiscal indicators at the local level. These fiscal indicators are the size of the property tax base of the host and adjacent municipalities; expenditure levels of municipalities following the establishment of the pulp mills; and the overall tax and debt burden of the municipalities. For each of the specific areas of investigation, baseline data is first analyzed and the impacts generated by the mills are assessed against this basis. Fiscal impacts are discussed first for the Grande Prairie Impact Area and then for the Peace River Impact Area.

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[37] See Gene F. Summers, E.M. Beck and C.Snipp. "Coping with Industrialization" in Non-metropolitan Industrialization. (Eds. R.Lonsdale and H.Seyler. John Wiley and Sons, New York, 1979.

5.1. Impact of Pulp Mills on the Property Tax Base of Host and Adjacent Municipalities

To measure and compare the impact of pulp mill development on the tax base of the various municipalities within the impact areas, it was necessary to obtain data pertaining to equalized assessments rather than actual or "live" assessments. For various reasons, for example, competition among municipalities, economic or administrative differences, differences in the date of the latest general assessment, and differences in assessment manuals used, property assessment levels vary from municipality to municipality. This makes it impractical to compare actual property values in one municipality with those of another municipality. To achieve some amount of uniformity among property values, the property tax base of municipalities is subjected to assessment equalization.

Equalization is done by first taking a sample of properties in each municipality. The average relationship between the assessed value and market value of the properties is then determined. This is referred to as the assessment to sales ratio or simply the assessment ratio. The same process is also carried out at the provincial level to establish an average provincial assessment ratio. The assessment ratios of the individual municipalities and that of the province are then compared and if differences exist, calculations are made to bring the assessment ratio of the municipality up to the provincial average. In this way the total assessed value of properties in each municipality is expressed in terms of a provincial average, that is, the total "live assessment" is equalized.

Equalized assessment is clearly a more realistic measure than "live" assessment for comparative analysis. Table 5.1 and Figure 5.1 show the equalized assessments for the Grande Prairie Impact Area for the six years prior to the arrival of the Proctor and Gamble mill, and for the construction and early operational phase of the mill. The data show that the tax base of the municipalities within the impact area

Table 5.1.

Equalized Assessment
Grande Prairie Impact Area

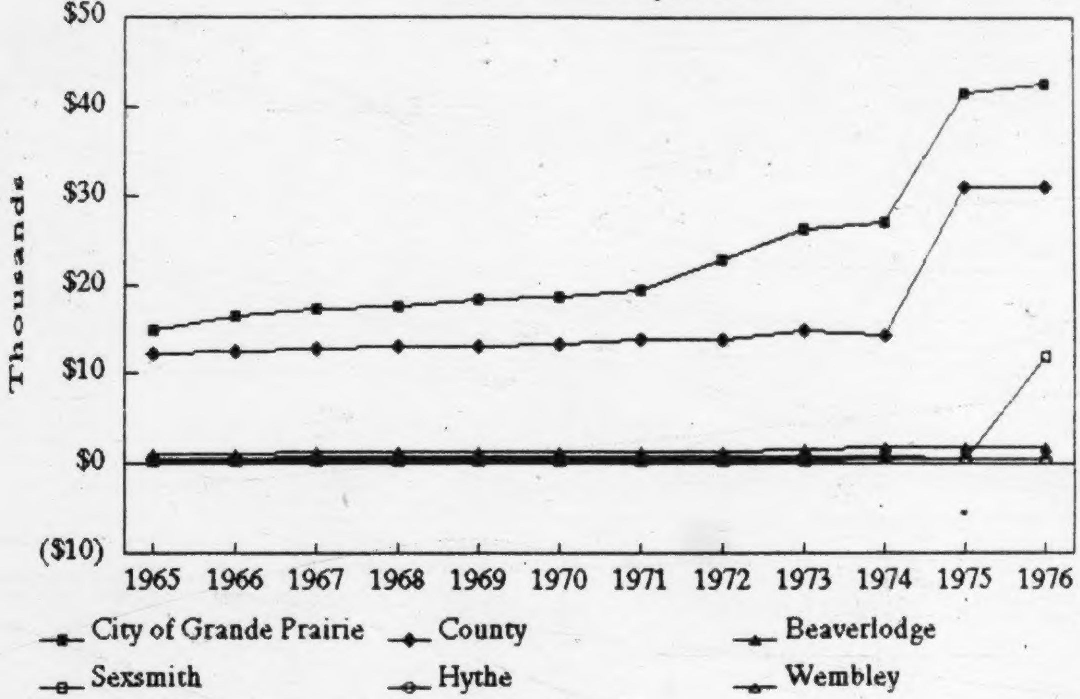
$'000

Year	City of Grande Prairie	County of Grande Prairie	B\lodge	Sexsmith	Hythe	Wembley
1965	14,932	12,292	1,110	665	657	243
1966	16,555	12,409	1,182	707	657	239
1967	17,243	12,726	1,271	728	602	243
1968	17,656	12,965	1,359	733	623	224
1969	18,426	13,105	1,426	747	628	223
1970	18,721	13,370	1,426	750	626	224
1971	19,507	13,784	1,473	792	647	234
1972	22,822	13,893	1,493	791	646	235
1973	26,359	14,894	1,589	807	639	305
1974	27,024	14,242	1,896	741	685	475
1975	41,730	31,041	1,921	906	561	498
1976	42,724	31,040	1,826	1,185	589	484

Source: Alberta Assessment Equalization Board

Figure 5.1 Equalized Assessment

Grande Prairie Impact Area



Source: Alberta Assessment Equalization Board

area either moderately increased or declined throughout the baseline period, 1965 - 1970. However, during the impact period, all the municipalities, except Hythe, experienced increases in the size of their tax bases. For the City of Grande Prairie and the County of Grande Prairie, the increase was undoubtedly a result of the presence of the pulp mill in the area. This is clearly seen in Figure 5.1 in the sudden, large departure from the normal trend of increases in the assessment bases of these two municipalities, after the pulp mill and related development began to appear on their tax rolls.

Of the two most affected municipalities, the City of Grande Prairie experienced the larger overall increase in its assessment base moving from $19.5 million in 1971 to $42.7 million in 1976, a total increase of $23.2 million. The assessment base of the County of Grande Prairie on the other hand increased by $17.3 million, moving from $13.7 million in 1971 to $31 million in 1976. That the City of Grande Prairie experienced a larger absolute increase in assessment after the construction of the pulp mill is particularly interesting because it reflects a situation in which assessment from residential, business and other development induced by the large-scale resource development in the main urban centre was larger than the assessed value of the resource industry itself. Whether this has occurred elsewhere is yet to be clarified but the figures clearly show the benefit of resource development to urban areas.

Were the increased assessment in the City of Grande Prairie not accompanied by such large population increases, then undoubtedly, the City would have been better off immediately with its expanded tax base. However, increased population generates the need for not only more of the same services provided earlier, but also for new types of services. Thus, as will be seen later in the analysis, the City of Grande Prairie did not improve its overall financial position as a result of its expanded tax base.

With respect to the assessment base of the smaller municipalities in the Grande Prairie Impact Area, the overall increase for any given municipality was less than $400,000 during the evaluation period. This is extremely small when compared to the $23 million increase experienced by the City of Grande Prairie and $17.3 million by the County. Among the small towns, Sexsmith showed the largest increase of $395,000 mainly because it functioned as a dormitory to the City of Grande Prairie. In Beaverlodge, the increase was slightly less than $352,000 and in Wembley $250,000. In the Village of Hythe the assessment base actually declined by $57,000 due, perhaps, to the declining value of many structures. Since the increases in the assessment base of the smaller municipalities, except Sexsmith, do not represent any significant departure from baseline trends (See Figure 5.1), it is concluded in this study that tax base gains from pulp mill development were not obtained by these municipalities.

In the Peace River Impact Area, the overall pattern in the changes to the assessment base of the municipalities differs from that of the Grande Prairie Impact Area at this stage. In this case, although the main urban centre, the town of Peace River has, to date, experienced a larger absolute increase in assessment than the host municipality, Improvement District 22, this situation is not likely to continue in the future.

According to Table 5.2, total equalized assessment for Peace River rose from $32.2 million in 1988 to $54.8 million in 1991, a total increase of $21.9 million. This compares with an increase of $5.4 in the assessment base of Improvement District 22 which rose from $42.8 million in 1988 to $48.2 million in 1991.[38/] The increase in assessment for the

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[38/] The equalized assessment figures for 1984 to 1989 are calculated at 20% Fair Assessment Value. Those for 1990 and 1991 are based on 65% Fair Assessment Value. For Purposes of comparison, all figures are expressed as 20% Fair Assessment Value.

Improvement District is only small at this stage because equalized assessment for the pulp mill has not yet been included. When this is done,.the overall increase in the tax base of the Improvement District will surpass that of the town of Peace River.[39] The reason for this is that growth in commercial and industrial assessment that is associated with large industrial development has not been experienced in the Peace River during the impact period.

Among the small towns in the Peace River Impact Area, none of them showed any increase in their assessment base that represents a significant departure from past trends (See Table 5.2.). This is similar to the experience of the small towns in the Grande Prairie Impact Area. There seems to be, therefore, a clear consistency in the pattern that the tax bases of these communities are unaffected by pulp mill development in the region.

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[39] The live assessment of the pulp mill is placed at $144 million .

Table 5.2.

Equalized Assessment
Peace River Impact Area

Year	Peace River	Grimshaw	Berwyn	Nampa	Manning	ID 22	MD 135
				$'000			
1984	41,515	14,908	2,727	2,161	6,802	40,590	15,956
1985	39,844	14,000	2,670	2,018	6,421	38,780	15,920
1986	39,980	12,979	2,710	2,046	6,623	37,200	15,781
1987	39,446	12,929	2,754	2,255	6,702	38,373	16,087
1988	33,000	13,494	2,873	2,399	6,881	42,841	16,386
1989	34,934	13,876	2,791	2,508	7,096	42,298	16,081
1990	47,107	14,168	2,917	2,558	7,352	45,413	17,113
1991	54,819	15,505	3,104	2,728	7,787	48,207	17,569

Source: Alberta Assessment Equalization Board

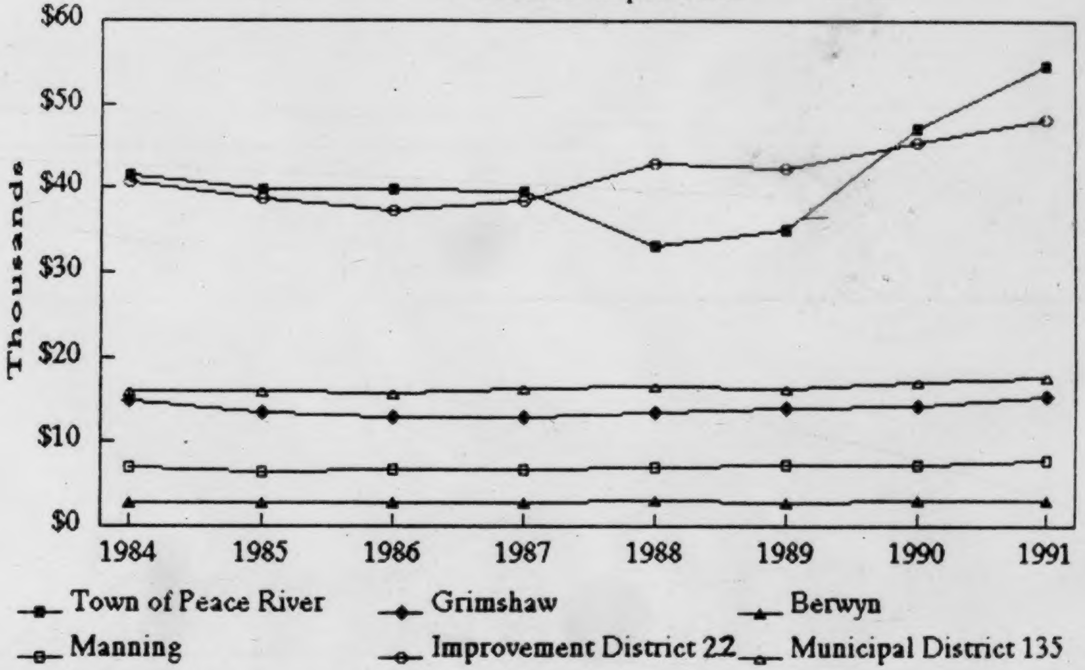


Figure 5.2 Equalized Assessment
Peace River Impact Area

Source: Alberta Assessment Equalization Board

Per Capita Equalized Assessment

Although total equalized assessment gives an idea of the relative increase in the size of the various tax bases, it is not a useful measure for determining the impact of the pulp mills on the revenue generating potential of each municipality. This is determined, more usually, by analyzing changes in per capita assessment figures. Generally, the higher the equalized assessment per capita, potentially, the better off are the tax payers in terms of lower tax payments and better or more services, or some combinations of these.

Table 5.3 and Figure 5.3 indicate changes in the per capita assessment for the various municipalities in the Grande Prairie Impact Area between 1965 and 1976. The Table and the Figure show that up to 1973, the City of Grande Prairie had the largest assessment base per capita in the impact area. This is not surprising as elsewhere, Parkinson (1979) has shown that in Alberta, there is a suggestive trend that taxes per capita increase with the population size of the community.

From 1974, the City's position was overtaken by the County. Between 1974 and 1976, the per capita assessment of the County of Grande Prairie increased from $1,633 to $3,394. During the same period per capita assessment in the City only increased

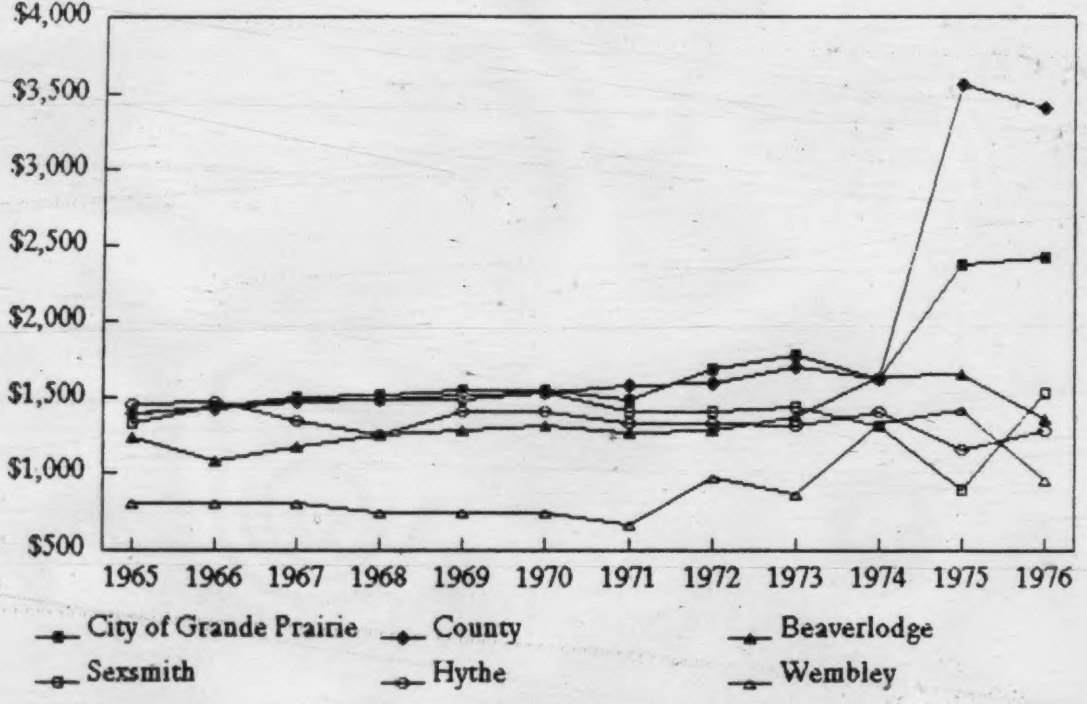
Table 5.3.

Per Capita Equalized Assessment, 1965 - 1976
Grande Prairie Impact Area

Year	Grande Prairie City	Grande Prairie County	B\lodge	Sexsmith	Hythe	Wembley
1965	1,394	1,396	1,238	1,233	1,464	803
1966	1,450	1,427	1,091	1,440	1,476	799
1967	1,510	1,475	1,173	1,482	1,353	813
1968	1,521	1,491	1,255	1,492	1,254	749
1969	1,554	1,495	1,292	1,521	1,410	746
1970	1,553	1,537	1,317	1,528	1,407	750
1971	1,491	1,580	1,275	1,414	1,334	669
1972	1,698	1,599	1,292	1,413	1,333	974
1973	1,788	1,707	1,376	1,442	1,317	872
1974	1,626	1,633	1,642	1,334	1,413	1,335
1975	2,367	3,558	1,663	904	1,157	1,425
1976	2,424	3,394	1,370	1,539	1,282	956

Source: Alberta Assessment Equalization Board

Figure 5.3 Per Capita Equalized Assessment
Grande Prairie Impact Area



Source: Alberta Assessment Equalization Board

from $1,6261 to $2,424. These figures indicate that although the City benefitted from a larger absolute increase in total assessment, it nevertheless fell way behind the County in terms of potential per capita revenue. Overall, the tax revenue generating capacity of the County became much greater than that of the City following the establishment of the mill. Since the County did not have to spend large amounts of money on residential infrastructure to support the mill related population, it found itself more financially privileged than the other municipalities in the impact area.

Regarding the small towns in the Grande Prairie Impact Area, per capita equalized assessment showed much variability during the evaluation period but although they all showed a slight secular increase by the end of 1976, it is noted that the per capita rate of expansion of assessment was much slower in the evaluation phase than in the baseline period. This means the probability of paying less taxes or having more municipal services provided in the baseline period was much greater than in the evaluation period. This situation is construed to be due to the general increases in the cost of municipal services over time rather than to any specific burden created by the pulp mill.

In the Peace River Impact Area, Improvement District 22 historically, has had a larger per capita assessment base than the town of Peace River and the other municipalities in the impact area except Municipal District 135 (See Table 5.4. and Figure 5.4.) This position was not only maintained during the immediate post-project period, but the gap between the Improvement District and the other municipalities, except the town of Peace River, has even widened. With the inclusion of the assessment from the pulp mill, the per capita position of Improvement District 22 will become even stronger since it will not have to bear the residential and related expenditure associated with the migrant population related to the pulp mill.

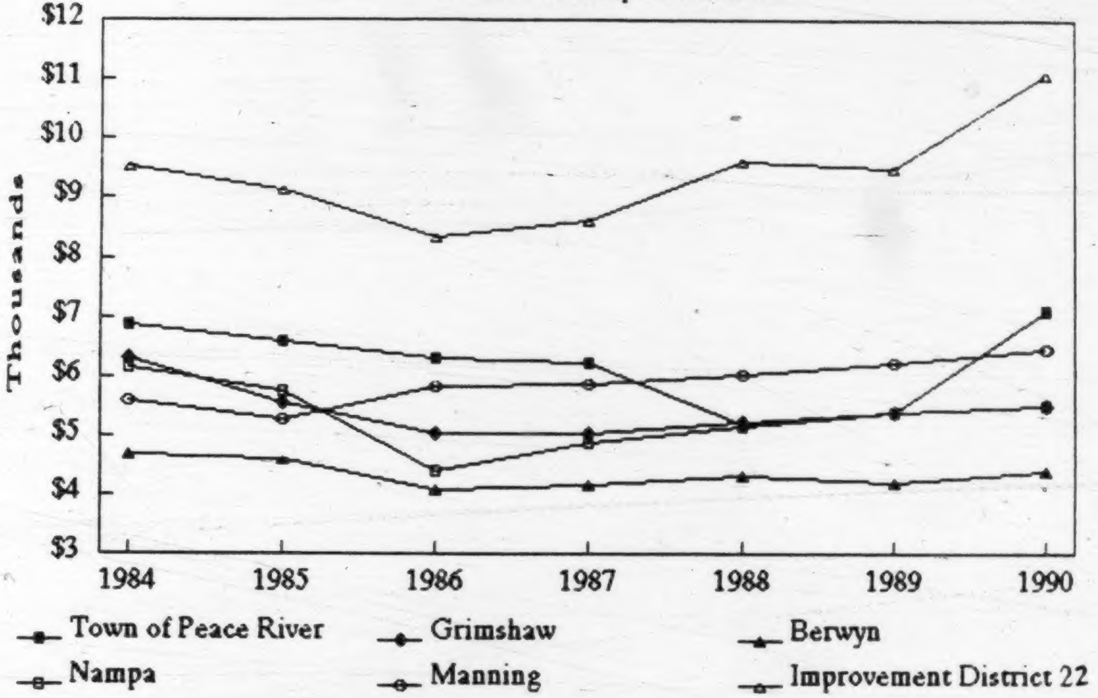
Table 5.4.

Per Capita Equalized Assessment
Peace River Impact Area

Year	Peace River	Grimshaw	Berwyn	Nampa	Manning	ID 22	MD 135
1984	6,870	6,296	4,662	6,141	5,593	9,551	10,080
1985	6.593	5,559	4,564	5,732	5,281	9,125	10,057
1986	6,291	5,041	4,075	4,400	5,810	8.350	10,315
1987	6,207	5,021	4,142	4,849	5,879	8,613	10,514
1988	5,193	5,240	4,321	5,158	6,036	9,616	10,710
1989	5,371	5,380	4,197	5,393	6,225	9,495	10,505
1990	7,090	5,502	4,386	5,501	6,449	11,064	11,185

Source: Alberta Assessment Equalization Board

Figure 5.4 Per Capita Equalized Assessment
Peace River Impact Area



Alberta Assessment Equalization Board

5.2. Impact of Pulp Mills on Municipal Expenditure Patterns

The foregoing sections have examined the extent to which the pulp mills have enhanced the fiscal capacity of individual municipalities. In this section, expenditure levels following the establishment of the mills are examined.

Table 5.5 and Figure 5.5 show movements in total expenditure for the period 1965 to 1976 for the various municipalities within the Grande Prairie Impact Area. The table and the graph indicate that total operating expenditure increased significantly in the County of Grande Prairie and also in the City of Grande Prairie following the establishment of the pulp mill. In the County, expenditures rose from $4.5 million in 1971 to $8.5 million in 1976. This compares with that of the City of Grande Prairie where expenditures increased from $3.1 million to $7.8 million during the evaluation period.

That the County experienced such large increases in its expenditure is particularly noteworthy because such increases in expenditure are not usually associated with rural municipalities which host large industrial projects. The functional categories that increased the most were transportation and education. Transportation costs relate mostly to the costs of maintaining roads which are owned by

Table 5.5.

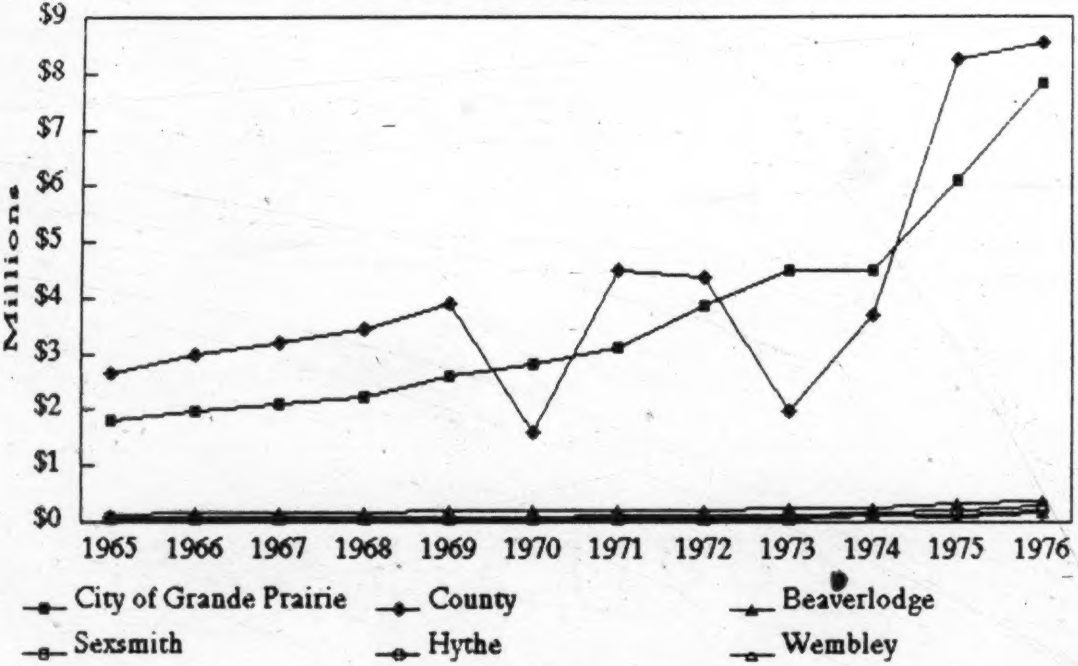
Total Operating Expenditure, 1965 - 1976
Grande Prairie Impact Area

Year	Grande Prairie City	Grande Prairie County	B\lodge	Sex-smith	Hythe	Wembley
		$'000				
1965	1,801	2,623	126	68	62	26
1966	1,984	2,971	140	76	69	33
1967	2,110	3,208	151	80	75	34
1968	2,233	3,437	153	82	82	38
1969	2,598	3,901	182	89	78	33
1970	2,812	1,578	176	79	77	36
1971	3,090	4,510	198	91	79	35
1972	3,854	4,377	212	116	87	40
1973	4,504	1,955	243	131	119	42
1974	4,503	3,715	238	156	126	99
1975	6,121	8,257	326	196	186	75
1976	7,844	8,544	382	267	589	157

Source: Municipal Statistics, Alberta Municipal Affairs.

Figure 5.5 Total Operating Expenditure

Grande Prairie River Impact Area, 1965 – 1976



Source: Municipal Statistics, Alberta Municipal Affairs

the County but which are used to facilitate trucking activities related to the pulp mill. Between 1971 and 1976, transportation expenditure increased by $1.7 million or from $920 thousand to $2.6 million. For education, increased costs were the result of the larger requisition that was levied on the expanded tax base of the County. Between 1971 and 1976, education costs increased by $810 thousand or from 2.6 million to $3.5 million. This situation indicates that even without tax sharing agreements of the type which will be discussed later, adjacent municipalities benefit from expanded tax bases via school board requisitions.

Large increases in municipal expenditure in the City of Grande Prairie are not surprising. With a sudden large increase in population such increases were expected. Expenditure was observed to increase by nearly 100% for all municipal services - transportation, public health and welfare, protective services, recreation and cultural activities and education.[40/]

In the Peace River Impact Area, changes in expenditure have not yet been significant in the host municipality. In fact, expenditures declined slightly during the construction phase

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[40/] Municipal Statistics, Alberta Municipal Affairs of the mill (See Table 5.6, Figure 5.6). In the main township, expenditure has fluctuated between $8 million and $10 million during the evaluation period. This small increase in expenditure in the town of Peace River is reflective of the minimum cost incurred by the town itself in preparation for the pulp mill. In the small towns, the increases in expenditure were all classified as "normal" by the town administrators as they were generally unrelated to the development of the pulp mill.

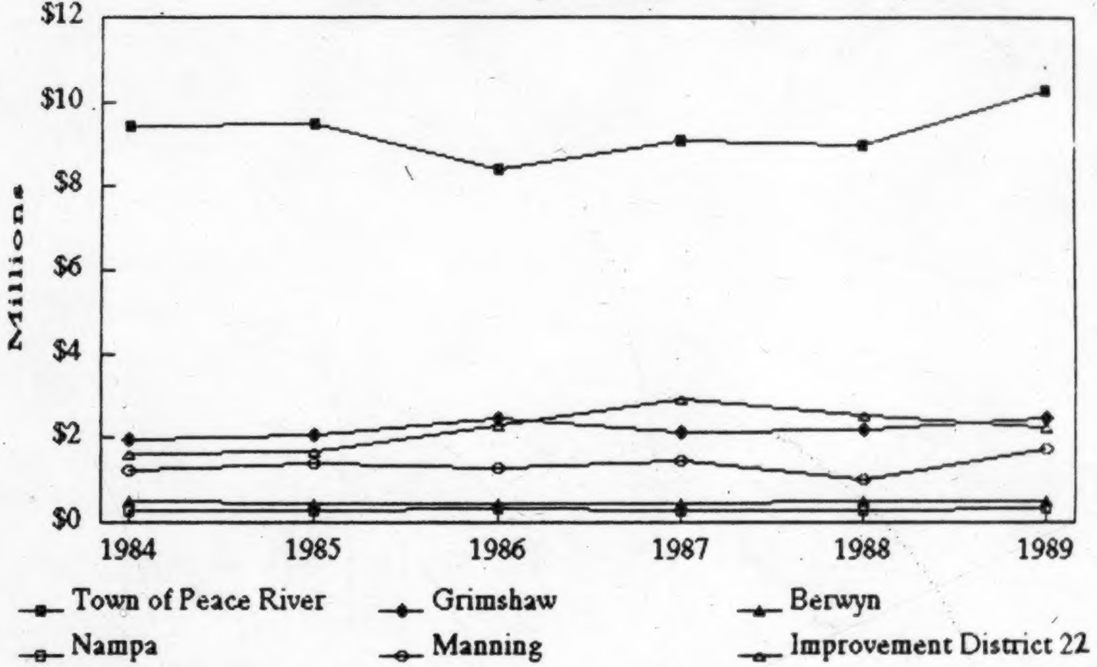
Table 5.6.

Total Operating Expenditure, 1984 - 1989
Peace River Impact Area

Year	Peace River	Grimshaw	Berwyn	Nampa	Manning	ID 22	MD 135
			$'000				
1984	9,427	1,926	511	265	1,210	1,624	1,224
1985	9,484	2,085	413	237	1,359	1,669	1,341
1986	8,446	2,438	432	307	1,294	2,264	1,517
1987	9,111	2,113	430	276	1,449	2,933	1,703
1988	8,997	2,160	465	287	1,310	2,520	1,826
1989	10,274	2,438	507	319	1,723	2,242	1,577

Source: Municipal Statistics, Alberta Municipal Affairs.

Figure 5.6 Total Operating Expenditure



Peace River Impact Area, 1984 – 1989

Source: Municipal Statistics, Alberta Municipal Affairs

5.3. Impact of Pulp Mills on Local Mill Rates

The extent of changes in local mill rates is usually considered to be a key indicator in measuring the financial impact of new industrial development. In this sub-section, changes in mill rates, which are tied to changes in the amount of taxes to be raised and the size of the tax base are examined. By comparing the taxes that were actually raised with the size of the tax base, the analysis reveals the impact the pulp mills have had on the fiscal burden of property owners in the affected municipalities.

Mill rates are derived from the unit of measurement referred to as the "mill". A mill is one tenth of a penny or one thousandth of a dollar. The mill rate is the amount of mills per dollar worth of property that is levied by a municipality. The mill rate is determined by dividing the total amount of taxes to be raised by the total assessment base of the municipality and multiplying the result by 1000. The mill rate obtained is then applied to the assessed value of each property to raise the taxes required. Generally, the higher the mill rate, the greater the tax burden on individual property owners.

With respect to the use of mill rates for comparative purposes, mill rates calculated from actual assessment could not be used because of the non comparability of actual assessments figures. Equalized local mill rates were thus calculated. The equalized local mill rates calculated here represent the total tax burden on property owners. That is, they include mill rates for school levies, hospital levies and other purposes. The equalized mill rates were calculated using the following formula:

$$\text{Total Equalized Mill Rate} = \frac{\text{Total taxation} * 1000}{\text{Equalized Assessment}}$$

Total equalized mill rates from 1965 to 1976 for the Grande Prairie Impact Area are shown in Table 5.7 and Figure 5.7. The table and the graph show that for the first four years after the arrival of the pulp mill, mill rates for the County of Grande Prairie continued to increase at much the same rate as they did during the baseline period. Only during 1975 and 1976 did the mill rates begin to show signs of greater increase over the other periods. This, no doubt, reflects the lag in time it takes for expenditure on maintenance of pulp mill related infrastructure by the County to be a significant part of its annual budget. Contrary to usual expectations, there was no actual decrease in mill rates levied by the

County. It is however noted that the County levied the lowest average local mill rates between 1971 and 1976. This reflects the comparatively low tax burden on property owners of that municipality as a result of the presence of the pulp mill within the County.

Table 5.7.

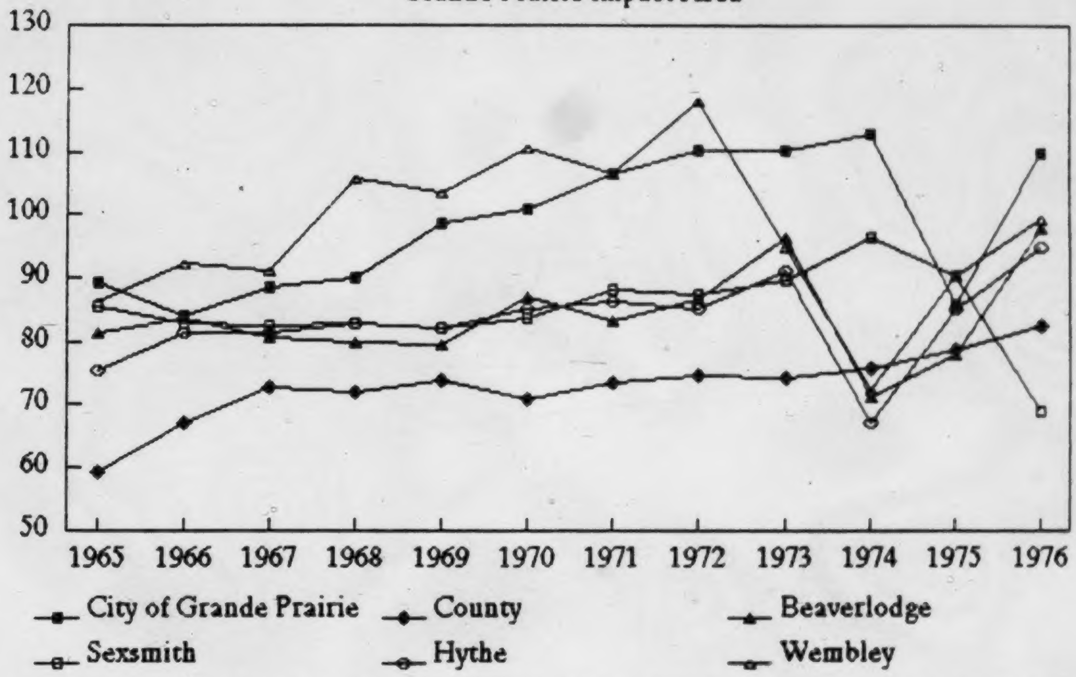
Equalized Total Mill Rates, 1965 - 1976
Grande Prairie Impact Area

Year	Grande Prairie City	Grande Prairie County	B\lodge	Sexsmith	Hythe	Wembley
1965	89.08	59.33	81.55	85.42	75.53	86.25
1966	83.94	67.02	83.46	82.99	81.53	92.22
1967	88.64	72.56	80.59	82.63	81.28	91.22
1968	90.17	72.13	79.85	82.76	82.95	105.57
1969	98.50	73.69	79.65	82.29	82.13	102.33
1970	100.70	70.79	87.17	83.65	85.05	110.51
1971	106.38	73.60	83.31	87.96	86.22	106.35
1972	110.34	74.64	86.52	87.19	85.22	118.18
1973	110.13	74.09	96.33	89.46	91.13	94.79
1974	113.05	75.64	71.25	96.31	67.17	72.52
1975	86.05	78.79	78.02	90.50	85.0	90.26
1976	109.98	82.50	97.85	69.0	94.70	99.41

Source: Municipal Statistics, Alberta Municipal Affairs;
Alberta Assessment Equalization Board.

Figure 5.7 Total Equalized Mill Rates

Grande Prairie Impact Area



Source: Municipal Statistics, Alberta Municipal Affairs

The smaller municipalities all showed fluctuations in the mill rates levied and although their overall average mill rate was substantially greater than that of the County of Grande Prairie, they were less than that of the City of Grande Prairie (See Table 5.7). The changes in mill rates in the small towns are attributed not to the presence of the pulp mills but rather to normal increases in the cost of municipal services. The average mill rate in the City was the highest during the evaluation period. This was due not only to the wider range of services offered by the City but also because the City was required to spend more on infrastructure and public services to support the mill induced population.

In the Peace River Impact Area, there has not yet been any significant departure from baseline trends in terms of changes in local mill rates and hence tax burden on the citizenry. The mill rate in Improvement District 22 which began to decline in 1986 continued to decline during the construction phase of the mill. Elsewhere, mill rates have continued to increase moderately, except for the towns of Peace River and Grimshaw (Table 5.8, Figure 5.8). In both of these municipalities, small decreases in mill rates have been observed but these may have been due to normal fluctuations in the yearly amount of taxes levied rather than to a general decrease in the overall tax burden.

Table 5.8

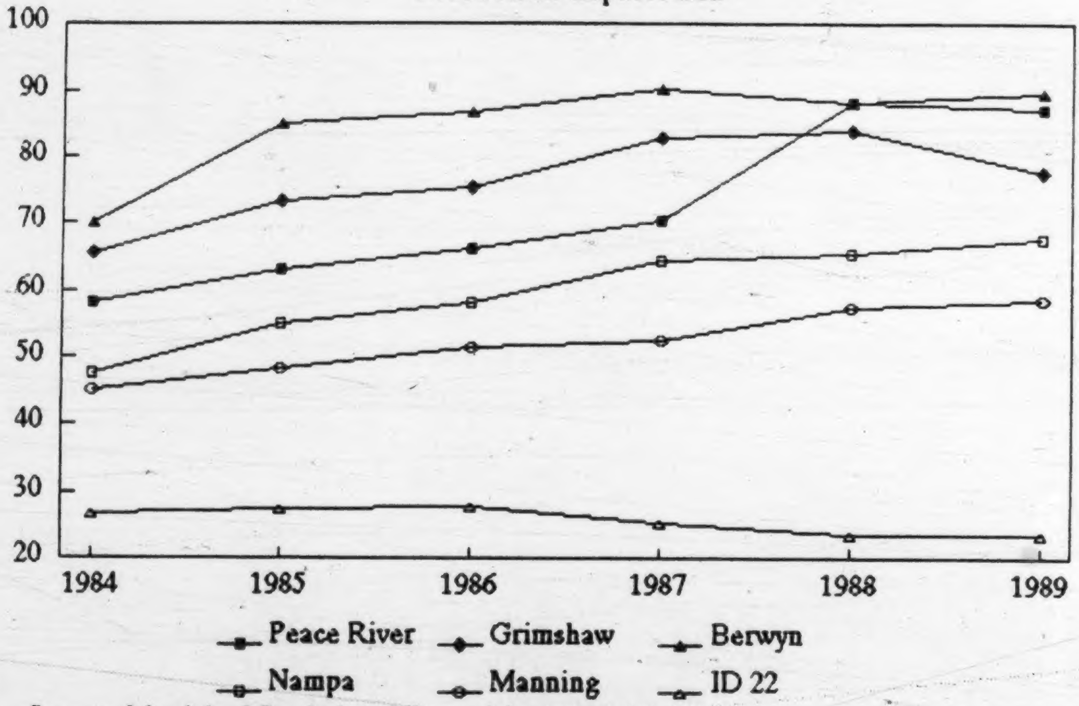
Equalized Total Mill Rates , 1984 - 1989
Peace River Impact Area

Year	Peace River	Grimshaw	Berwyn	Nampa	Manning	ID 22	MD 135
1984	57.98	65.64	70.29	47.38	44.93	26.76	27.85
1985	63.0	73.15	84.88	55.1	48.15	27.5	32.79
1986	66.18	75.49	86.54	58.0	51.37	27.7	34.94
1987	70.41	82.97	90.22	64.44	52.33	25.42	36.62
1988	88.2	83.89	88.16	65.6	57.44	23.39	35.59
1989	87.2	77.43	89.68	67.82	58.52	23.56	35.87

Source: Municipal Statistics, Alberta Municipal Affairs;
Alberta Assessment Equalization Board

Figure 5.8 Total Equalized Mill Rates

Peace River Impact Area



Source: Municipal Statistics, Alberta Municipal Affairs

5.4. Impact of Pulp Mills on Municipal Debt Burden

In several reported experiences with large-scale industrial development project, municipalities have reported sudden and dramatic increases in the local debt burden as a large amount of spending is done to install infrastructure to support the new industry and the anticipated increase in population.

In the Grande Prairie Impact Area, there was no dramatic increase in the size of either the absolute debenture debt or the per capita debenture debt burden in the host municipalities and in the main urban centres (Table 5.9, Figure 5.9). In the County, per capita debt fluctuated during both the construction and operational phases of the mill, but a moderate secular increase was noted after 1973. The County nevertheless had the lowest per capita debt within the Impact Area since the arrival of the pulp mill. The slight increase in per capita debenture debt is reflective of the minimum amount of capital expenditure incurred by the County to support the mill.

Although significant residential and other urban development took place in the City of Grande Prairie between 1971 and 1976, per capita debt only increased from $350 to $458. This was because the cost of front-end servicing of the increased population was spread over the incoming population as well as the existing population.

Table 5.9.

Debenture Debt Per Capita, 1965 - 1976
Grande Prairie Impact Area

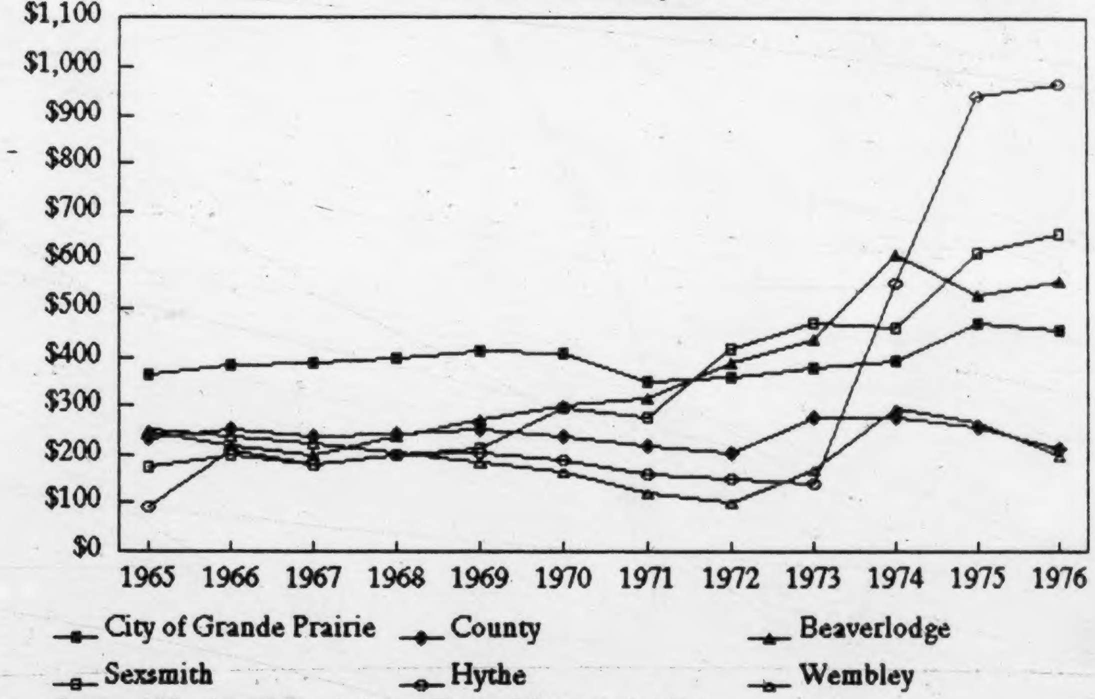
$'000

Year	Grande Prairie City	Grande Prairie County	B\lodge	Sex-smith	Hythe	Wembley
1965	366	234	246	175	94	254
1966	384	254	217	197	210	240
1967	390	237	201	178	179	222
1968	400	243	236	197	197	203
1969	414	251	283	215	203	183
1970	409	239	299	295	188	163
1971	350	219	314	278	160	122
1972	359	206	386	415	150	103
1973	378	276	435	472	139	170
1974	392	275	613	463	551	294
1975	470	256	529	618	943	268
1976	458	215	559	653	964	198

Source: Municipal Statistics, Alberta Municipal Affairs.

Figure 5.9 Debenture Debt Per Capita

Grande Prairie Impact Area



Source: Municipal Statistics, Alberta Municipal Affairs

In the Peace River Impact Area, it is not expected that debenture debt per capita will depart from the trends indicated in Table 5.10 and Figure 5.10 during the operational phase of the mill. For Improvement District 22, a report prepared by Masson Management Services (1989) on behalf on Improvement District 22, suggests that most of the additional costs induced by the mill will be operational costs. Such costs include those for road maintenance, recreation transfers to urban municipalities which provide recreation facilities and programs for residents of the Improvement District, garbage collection and disposal, and administration. Only for the replacement of fire fighting equipment and for water sewer expansion might there be a need for debenture to be raised and this total is not likely to exceed $60,000.

In the town of Peace River, the lower than expected population increase will put less immediate demands on the capital infrastructure requirements of the town. But the need for a new sewage treatment facility still seems to be urgent. This facility is estimated to cost approximately $10 million. Under present infrastructure financing arrangements, 75% of this total will be borne by the province while 25% will be borne by the town. This local share will be raised by issuing debentures. Beyond the need for a new sewage plant, it is not quite clear what the other immediate infrastructure needs of the town are because the estimates that are available are based on forecasted population levels of between 7,500 to 10,000 which have not been reached.

In the town of Grimshaw and the Villages of Berwyn and Nampa, there are no forecasts of immediate major capital spending as a result of the mill. Debenture debt is thus not an issue. In fact in Grimshaw, careful financial planning on a ten year basis has allowed costs and debt and to remain low.

Table 5.10.

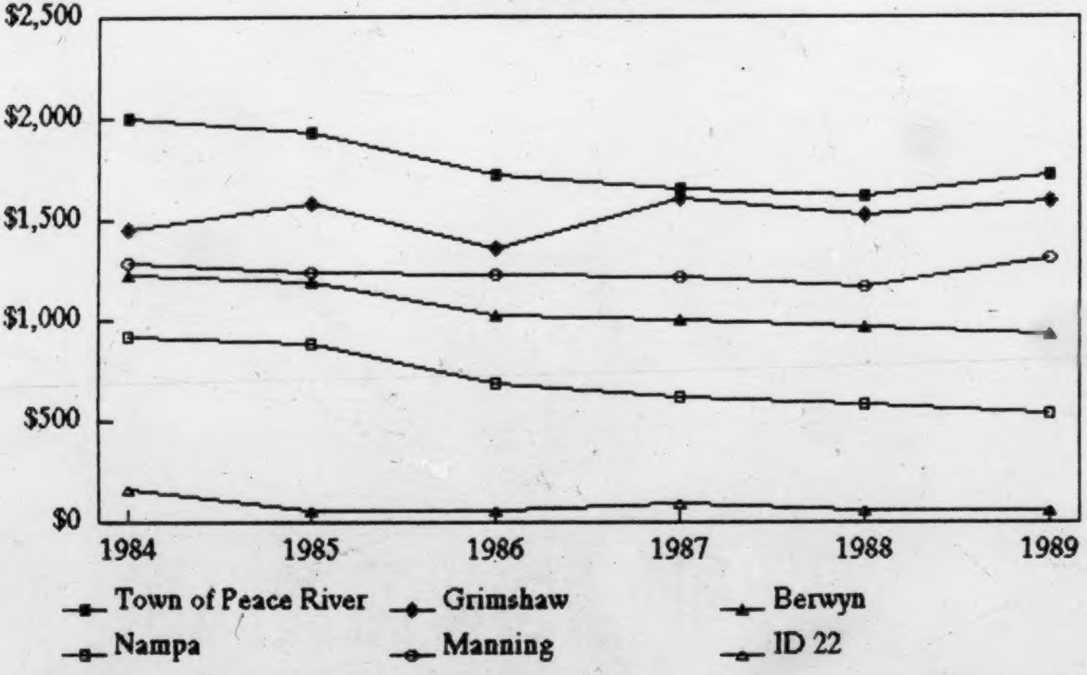
Debenture Debt Per Capita, 1984 - 1989
Peace River Impact Area

Year	Peace River	Grimshaw	Berwyn	Nampa	Manning	ID 22	MD 135
1984	1,995	1,455	1,229	923	1,283	163	248
1985	1,931	1,584	1,193	887	1,243	60	244
1986	1,715	1,353	1,029	686	1,226	60	250
1987	1,644	1,605	1,001	612	1,212	91	243
1988	1,609	1,524	965	576	1,163	56	237
1989	1,713	1,594	928	538	1,306	55	231

Source: Municipal Statistics, Alberta Municipal Affairs

Figure 5.10 Debenture Debt Per Capita

Peace River Impact Area



Municipal Statistics, Alberta Municipl Affairs

5.5. Conclusion

The foregoing discussion has demonstrated that the municipalities which host the pulp mills have experienced the type of industrial development that municipalities desire the most, that is, industrial development which result in large increases in assessment without a corresponding large increase in population. The host municipalities have thus derived a positive net benefit from industrial development. This is reflected in the positive movement of their financial indicators - lower property rates of taxation and per capita debenture and increased assessment per capita. It is noted however, that although the revenue position of the host municipalities have been significantly enhanced by the pulp mills, expenditures have also risen considerably. Thus, their net fiscal position may not be as favourable as many people are prone to think.

Among the adjacent municipalities, the financial position of the small towns were found to have been scarcely affected by the pulp mills. Equalized assessments have not shown any increase that represent a significant departure from baseline trends. The same is also true for mill rates, expenditures levels, and debenture debts.

Although the financial position of the two largest urban centres were expected to be the most affected by the pulp mills, only in the case of the City of Grande Prairie has this been observed. The City benefitted from large increases in total assessment induced by the mill but the increase in assessment has not been enough to offset increased expenditures, and per capita debt and mill rates rose accordingly. The City thus experienced additional fiscal burden following the establishment of the mill.

In the town of Peace River, it is still too early to grasp the full fiscal impacts of the pulp mill. Indications are, nevertheless, that the mill has hardly affected the financial position of the town because of the low population increase, and also because the town itself was not directly involved in land development in anticipation of large in-migration.

The variations in the impact of the pulp mills on different communities have implications for the quality of life in the respective municipalities. Adequate fiscal policies to address the imbalance between benefits and costs are thus required if fiscal and quality of life disparities are to be reduced.

CHAPTER SIX

6.0. POLICY IMPLICATIONS OF LARGE-SCALE RESOURCE PROJECTS FOR LOCAL ECONOMIC AND REGIONAL DEVELOPMENT

The preceding three Sections have focused on the demographic, economic, and municipal financial impacts of pulp mill development in northern Alberta. The findings in these Sections confirm the conclusions reached by a number of other researchers on this subject that large-scale resource projects in non-metropolitan areas do result in increased population, employment, income, and tax receipts, but that these positive effects are not forthcoming in all cases and whenever they do, they are spatially concentrated. This Section discusses the implication of these findings in relation to possible policies for municipal and regional development.

6.1. Demographic Policies

At the demographic level, it is doubtful whether the tendency of migrant workers to settle in larger urban centres can be easily influenced. Migrant workers will continue to be attracted to places that are perceived to offer a higher quality of living. Smaller municipalities, disadvantaged by the level of residential facilities and public services that they can offer, may thus continue to be largely by-passed for the larger urban centres.

Some writers, for example, Roterus (1978), have suggested that small towns should invest in facilities to make themselves attractive for investors and migrant workers. Although some small towns have had success with this strategy, the fact remains that this has only come about after several years of waiting (Roterus, 1978). Clearly, for small municipalities in primary resource producing regions, such a strategy is not only expensive but also unrealistic given the grave uncertainties that are associated with plans to develop any resource. From a policy standpoint, it would seem best for small municipalities to adopt a policy based on infrastructure investment as the need arises. With such a policy, the potential for costly mistakes is minimized. This is because infrastructure investment would be primarily geared towards making the communities attractive for local residents and not for the explicit purpose of attracting large industries.

Judging from the results of the study done by Masson Management Services in 1989 in the Peace River area, it is evident that many small towns in northern Alberta are likely to possess significant under-utilized capacity for various infrastructure and services. The implementation of plans to accommodate forecasted population increases could therefore be delayed until there are firm indications that the forecasted growth will in fact occur. Since large and rapid population growth is also not inevitable in all larger urban places that are located in the commuting zone of resource industries, a similar policy is also applicable. Otherwise, municipalities would invest in expensive infrastructure in anticipation of a population increase that never materializes.

6.2. Economic Policies

As regards local economic development, it is clear that induced development in the form of new business activity and employment will continue to be concentrated in the larger urban centres. This is not surprising because the support for modern resource development is urban oriented, usually with a tendency towards larger urban centres. Such support includes communication facilities, banking and other financial services, residential and educational facilities, commercial centres and recreational facilities.

In order to take as much advantage as possible from the spin-off generated by the new industry, urban municipalities have to reduce the level of leakages from the local urban economy. One way of doing this is for the local Chamber of Commerce and the local Economic Development department of the municipality to make conscious efforts to encourage and support their members and residents in service and supply businesses that cater to the needs of the resource company. Otherwise most of the service and supply contracts may go to companies located in even larger urban centres, or as Moseley (1974) pointed out, to the former suppliers of the company.

The local business sector in the rural municipalities and adjacent small towns may also be able to benefit from service and supply contracts, but competition from companies located in the larger urban centres could create difficulties for them. These municipalities are thus faced with the reality that economic benefits from resource projects may be very elusive and their best chance for economic development may not lie on depending on the arrival of these types of industries to the region. Rather, their best chance seems to be in the widely discussed approach to rural development which focuses on supporting and encouraging local industries based on local resources and regional, national or international markets (Bryant 1980; Economic Council of Canada, 1990).

This reality is a difficult one to admit but the experience of the communities reviewed for this report along with those analyzed in this study suggest that intra-regional economic imbalance is not likely to be reduced by large-scale resource projects. The main reasons for this is the tendency for economic benefits to be spatially concentrated, as well as the fact that a substantial portion of the total benefit induced by the project is not retained in the immediate impact area.

For the region as a whole, resource development does bring substantial benefits. It adds to the economic base of the region, and it may result in a larger population and hence market for local businesses. Additional benefits include a more skilled workforce, new technology, additional infrastructure, particularly roads, and possibilities for greater urban development. These benefits cannot be readily measured in monetary terms but neither their impact and significance for community and regional development in remote areas can be easily overlooked. Given the direct and indirect contributions that large-scale resource projects make towards regional development, local economic policies which are supportive of these firms should be encouraged.

6.3. Fiscal Policies

Resource development in northern Alberta and other resource producing regions in Canada will continue to be characterized by a separation of where workers live and where the resource is actually being developed. In this scenario, it is inevitable that questions pertaining to the sharing of financial costs and benefits of resource development will arise.

At the most basic level, it is desirable that those municipalities be compensated which incur public financial cost to support the residential and other needs of workers. In Alberta, an Industrial Tax Transfer Program has been in place since 1976. This mechanism seeks to compensate municipalities for increased expenditure by using the number of workers associated with an industrial development and their dependents who live in the municipality, as the basis for compensation. The fact that this is an institutionalised system is indeed creditable because in instances where tax sharing is left entirely to the initiative of the host municipality, the possibility of conflict becomes greater.

As an example of a revenue sharing agreement, the Industrial Tax Transfer Program is, however, very limited in that it restricts itself only to Improvement Districts which host the industry and to towns and villages which are located within the Improvement Districts. Thus, in the context of the communities discussed in this study, were revenue shared according to the rules of the Industrial Tax Transfer Program, only Manning would have been eligible for compensation as this is the only town located within Improvement District 22. The towns of Peace River and Grimshaw lie outside of the Improvement District and would not be eligible for compensation although most of the mill related workers and their families live there. On this issue Ebel (1985) has pointed out that inequitable treatment of similarly affected municipalities is a violation of the basic public financial principle of horizontal equity and is a major reason why a more equitable system should be implemented in Alberta.

The recent voluntary revenue sharing agreement between Improvement District 22 and all the municipalities affected by the Daishowa mill contains most of the elements of current thinking on tax revenue sharing agreements. For example, in this agreement, there is explicit recognition that significant costs are incurred by the host municipality. The agreement therefore entitles the host municipality to not share all of its new revenue, but to withhold a part for its own expenses. But the agreement also recognises, at least in principle, the new cost structure of all other affected municipalities regardless of whether the municipalities are located within an Improvement District or not. Finally, the agreement makes allowance for the fact that costs experienced by adjacent municipalities may decline with time as residential and commercial development associated with the new population begins to appear on assessment rolls. Costs may also decrease because initial front-end financing is no longer an issue. Decreasing costs entitles the host municipality to share less and less of its annual revenue from the new development.

Although the tax revenue agreement between the municipalities in the Peace River Impact Area represents a more advanced approach to industrial tax sharing among municipalities in Alberta, there are certain problems with this approach which may eventually have to be addressed.[41/] First, it is noted that it is the percentage of workers and their dependents living in each municipality that is used as the basis for sharing revenue. This means that those municipalities which may have already been operating at full capacity in terms of certain infrastructure, will find it more expensive to host an additional 100 persons than a municipality which has been previously operating well below capacity. This is the

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[41/] See Appendix Five for a copy of the Agreement including the formula used to share tax revenue.

familiar marginal cost /average cost problem and implies that revenue sharing should be based on fiscal need rather than only on the number of workers and their dependents living in each municipality. One way of resolving this problem is that workers who are new residents to a municipality should be given a weight in the formula that is twice the size of a worker who is a long-time resident of the municipality. Alternatively, where a costly new infrastructure will be required, the weight attached to a worker living in that municipality should be greater than the weight attached to a worker living in a municipality that does not have to install similar infrastructure.

Secondly, there is a need for the taxes paid by the resource industry to be related to the costs incurred for servicing the industry within the entire impact area. Under the present system, the Improvement District levies a mill rate based on the total taxes which is raised to cover costs only in the Improvement District. As can be seen from Table 5.8, the mill rate for the Improvement District is the lowest for the Impact Area. A low mill rate in the host municipality results in a small amount of property taxes paid by the resource company. Thus, instead of the $3 million forecasted in the official Impact Assessment by Simon (1988) as annual property taxes to be paid by Daishowa in 1991, the pulp mill will only pay $974,000 in property taxes for 1991.[42]

It is not known if this total is indicative of the yearly amount that will be paid in property taxes, but assuming that it is so, when this total is considered in relation to the requirements of the revenue sharing agreements, the results are not very encouraging. Given that the Improvement District gets 50% of the total in the first year, 60% in the second year, and 70% in the third year, and also assuming that the workers were evenly distributed among the remaining six municipalities, then each municipality would only receive $81,116 for the first year, $65,000 for the second year, and $48,700 for the final year.

In the particular case of the Peace River Impact Area, municipalities have been spared financial difficulties because the expected boom did not materialize along with its inherent capital expenditure. Had the boom materialized, certainly the returns from the revenue sharing agreement would have fallen far below the cost of providing new infrastructure and services.

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[42] Information obtained from Improvement District 22.

A third problem is that the present approach only addresses the financial costs incurred by municipalities which host workers of the mill. However, other municipalities may experience environmental costs and other social cost associated with resource development and these also should be included in the construction of the revenue sharing formula.

Finally, mention has been made in the literature for the need of regional fiscal policies to deal with the problem of fiscal disparity that arises from large-scale resource development. Such a strategy holds much potential for regional development if municipalities are willing enough to cooperate in its implementation. A regional fiscal policy for impacted areas in northern Alberta would be based on considerations such as fiscal need, fiscal effort, and other political developmental considerations in the region. The main advantage of such an approach is that municipalities that are not directly affected by the project may still obtain some benefits and be able to offer a reasonable standard of living to their residents.

CHAPTER SEVEN

7.0. CONCLUSION

This study has analyzed the demographic, economic and municipal financial impacts of pulp mill development in two selected areas in northern Alberta. The focus of the study has been on the size and geographical distribution of impacts within the commuting zone of the industry. While the two pulp mills have generated basically the same amount of in-migrant population, employment, income, and fiscal impacts, there is considerable variation in the growth impulses that were actually transmitted to the two impact areas. In the Grande Prairie Impact Area substantial development occurred following the establishment of the pulp mill. Although the pulp mill contributed significantly to this development, it was found that the "take off" in Grande Prairie was due, not singularly to the pulp mill, but rather to the combined effect of various developmental influences, including the pulp mill, acting concurrently. In the Peace River Impact Area, forecasted growth did not occur because of previous high unemployment which caused out-migration from the area.

As regards the spatial distribution of impacts, only the main urban centres in the impact areas actually received noticeable benefits from the pulp mills. The two rural host municipalities did receive sizeable fiscal benefits which were expected but they were effectively by-passed in terms of demographic and economic benefits. The rural small towns generally did not participate in neither the demographic, economic or fiscal benefits that were generated by the new resource industries.

Based on the above findings, it appears that local decision makers in non-metropolitan areas should be made aware of the fact that the mere establishment of a large resource industry either within or near to their communities does not necessarily mean that economic miracles will be forthcoming immediately. In fact, for many communities, there is a high probability that the economic growth forecasted in ex-ante impact statements may never appear.

This view is not anti-large scale resource development. Rather, it simply seeks to indicate that for all their worth to the national and provincial economies, large scale resource projects, may not be the most important factor in the economic development of many of the remote communities with which they are associated, particularly small town and rural municipalities. The economies of these communities may be better stimulated by smaller, indigenous type of industrial development. Such a strategy for development has been already promoted in Alberta, for example, through the Rural Business Projects Program.[43/]

Finally, a word on future research direction. One area that requires further study is the manner in which secondary employment and other benefits are translated into development impulses in impacted communities. Usually multiplier estimates are made which give the impression that secondary impacts are immediately generated in the affected communities. In reality, some of these impacts may appear several years after the project has been initiated. Also, they may occur in uneven spurts over time. Given that local communities stand to gain the most from spin-off effects of resource projects, there seems to be a need for a better understanding of these actually operate and how these benefits occur over time.

In addition to the substantive area for further research, there is also the methodological problem of selecting appropriate research techniques for studying actual economic changes at small geographical levels. One of the major difficulties encountered in this study was the inability to

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[43/] See Currie, Coopers and Lybrand, 1984, An Assessment of the Rural Business Projects Program, Department of Tourism and Small Business, and Department of Municipal Affairs, Government of Alberta.

use certain techniques used at the national and regional level to assess economic changes at the intra-regional and local levels. The main reason for this is that economic data are not normally disaggregated at the level of villages or small towns or other municipalities below a certain population level. This problem has been discussed in the regional development literature as it relates to the preparation of income accounts (e.g. Isard, 1960, Bendavid, 1972) but, it is evident that it is also prevalent as regards other types of local economic studies.

The lack of more refined techniques to carry out ex-post economic evaluation at the local level is one reason why there has been a tendency to avoid this area of analysis (Leistritz et al 1982). The data gaps and the numerous assumptions that have to be made could lead to measurements of less than required accuracy. For this reason, another area for future research effort may well be in the refining of techniques for ex-post economic evaluations at the local level.

BIBLIOGRAPHY

Alberta Municipal Affairs Division, 1984, IMPACT Model, Planning and Research Branch, Edmonton.

Barlow, I.M., 1981, Spatial Dimensions of Urban Government, Research Studies Press, Chichester.

Barrows, Richard, and Marj Charlier, 1982, "Local Government Options for Managing Rapid Growth", in Coping with Rapid Growth in Rural Communities (Eds.) Bruce A Weber and Robert E. Howell. Westview Press, Boulder, Colorado.

Bendavid A., 1972, "Regional Economic Analysis for Practitioners. Praeger.

Bowles, Roy T., 1981, Social Impact Assessment in Small Communities. Butterworth, Toronto.

Braschler, Curtis and John A. Kuehn, 1976, "Estimation of Employment Multipliers for Planning in Ozarks Non-Metropolitan Counties" in Southern Journal of Agricultural Economics. July, pp.187 -192.

Bryant, C.R., 1980, "Manufacturing in Rural Development" in Planning Industrial Development. John Wiley and Sons, Ltd.

Burchell, R.W., and D. Listokin, 1978, The Fiscal Impact Handbook. Rutgers Center for Urban Policy Research, New Brunswick, N.J.

Casley, Dennis J. and Denis A. Lury, 1982, Monitoring and Evaluation of Agriculture and Rural Development Projects. John Hopkins University Press, Baltimore.

Co-West Associates, 1981, Socio-Economic Overview of Northern Alberta. Northern Alberta Development Council, Edmonton, Alberta.

Crow, Robert Thomas, 1973, "A Nationally Linked Regional Econometric Model". Journal of Regional Science. Vol 13, No. 2.

Cunningham, Alain, 1984, Socio-Economic Impact Assessment Development Theory And Northern Native Communities.

U.B.C. Planning Papers, Studies in Northern Development, No 4., University of British Columbia.

Currie, Coopers and Lybrand, An Assessment of the Rural Business Projects Program, Department of Tourism and Small Business and Department of Municipal Affairs.

Czamanski, S. and E.E. Malizia, 1969, "Applicability and Limitations in the Use of National Input-Output Tables for Regional Studies", Papers, The Regional Science Association, Vol. 23. pp. 65- 77.

Dale, Norman, and Sheryl Kennedy, 1981, "Towards a Socially Relevant Process of Impact Assessment" in Canadian Symposium on Social Impact Assessment, (Eds.) Frank J. Tester and William Mykes, Kananaskis Centre for Environmental Research, University of Calgary.

D'Amore, Louis J. and Shiela Rittenberg, 1978, Social Impact Assessment: A State of the Art Review, Urban Forum, Vol. 3, No. 6.

Davis, H. Craig, 1976, "Assessing the Impact of a New Firm on a Small Scale Regional Economy: An Alternative to the Economic Base Model". Plan Canada, Sept. / Dec., pp. 171- 176.

Davis, H. Craig, 1980, "Income and Employment Multipliers for a Small B.C. Coastal Region", Canadian Journal of Regional Science, Vol 3, No. 2

Davis, H. Craig, 1986, "Income and Employment Multipliers for Seven British Columbia Regions", Canadian Journal of Regional Science, Vol. 9, No. 1, pp. 103-115.

Ebel, B.J., 1985, The Municipal Financial Impact of Large Scale Natural Resource Projects, Alberta Municipal Affairs, Edmonton.

Economic Council of Canada, 1990, From the Bottom Up. The Community Economic-Development Approach.

Engle, Robert F., 1974, "Issues in the Specification of an Econometric Model of Metropolitan Growth". Journal of Urban Economics, Vol 1, pp. 250-267.

Fairbairn K.J. and R.G. Ironside, 1973, An Economic Base Study of the Peace River Region of Alberta, Peace River Regional Planning Commission.

Finsterbusch, Kurt, 1977, "The Potential Role of Social Impact Assessment in Instituting Public Policies" in Methodology of Social Impact Assessment (Eds.) Kurt Finsterbusch and C.P. Wolf, Dowden, Hutchinson and Ross, Inc., Pennsylvania.

Flynn, Cynthia B., James H. Flynn, James A. Chalmers, David Pijawka and Kristi Branch, 1983, "An Integrated Methodology for Large Scale Development Projects" in Social Impact Assessment Methods (Eds.) K. Finsterbusch, L. Llewellyn and C.P. Wolf, Sage Publications, Beverly Hills.

Frank E. Price and Associates Ltd., 1970, An Economic Evaluation of Census Division 15. Department of Indian Affairs and Northern Development, Alberta.

Garrison, Charles B., 1971, "New Industry in Small Towns: The Impact on Local Government", National Tax Journal, Vol 24, No. 4. pp 493 - 500.

Gartrell, John W., David Sunahara and Harvey Krahn, 1980, Cold Lake Baseline Study: Phase II, Report VI - Research Methods. Alberta Economic Development, Northern Development Branch

Gerweck, John E. and Donald J. Epp, 1974, "The Effects of Industrial Growth on the Local Real Estate Tax: An Expanded Model" in Land Economics, Vol. 50, No. 4, pp 397 - 401

Gilmore, John and Mary Duff, 1975, Boom Town Growth Management: A Case Study of Rock Springs - Green River, Wyoming, Westview Press, Boulder, Colorado.

Glasson, John, Dominique Van Der Wee, and Brendan Barrett, 1987, "A Local Income and Employment Multiplier Analysis of a Proposed Nuclear Power Station Development at Hinkley Point in Somerset". Urban Studies, pp 248 - 261.

Glickman, Norman J., 1971, "An Econometric Forecasting Model for the Philadelphia Region", Journal of Regional Science, Vol. 11, No. 1.

Glickman, Norman J., 1977, Econometric Analysis of Regional Systems: Explorations in Model-Building and Policy Analysis. New York: Academic Press.

Greig, Micheal A., 1971, "The Regional Income and Employment Multiplier Effects of a Pulp and Paper Mill" in Scottish Journal of Political Economy, Vol. 18, pp. 31 - 48.

Groves, H.M. and John Riew, 1963, "The Impact of Industry on Local Taxes - A Simple Model, National Tax Journal, Vol. 16, No. 2, pp. 137 - 146.

Harding, Joe and Micheal J. Livesay, 1984, Social Impact Assessment and Their Implications for Planners in Applied Science for Environmental Planning (Ed.) William Milsap, Westview Press, Boulder Colorado.

Hatry, Harry, Richard Winnie, and Donald Fisk, 1981. Practical Program Evaluation for State and Local Governments, The Urban Institute Press, Washington D.C.

Haynes, Paul A., 19 , Towards a Concept of Monitoring, Town Planning Review, Vol. 45, No. 3, pp. 5 - 29.

Hollinshead Lefrancois and Associates, 1979, Grande Prairie Growth Study.

Ironside, R.G. and I. Mellor, 1974, Deficiencies in the Growth Centre Approach to Regional Development, Proceedings of the International Geographic Union Regional Conference and Eight New Zealand Geography Conference, Palmerston, North.

Ironside, R.G. and K.J. Fairbairn, 1977, "The Peace River Region: An Evaluation of a Frontier Economy, Geoforum, Vol. 8, pp. 39-49.

Ironside,R.G. and Dale D. Peterson, Edmonton's Wholesale Relationships with Northwest Canada, Canadian Geographer, Vol. 26, No. 3, 1982.

Ironside, R.G., and Wolfgang Fieguth, 1990, "The Alberta Forests Industry: Top Down Initiatives - Bottom Up Problems". Paper Presented at Canadian Association of Geographers Conference, Edmonton, Alberta.

Isard, W. 1960, "Methods of Regional Analysis: An Introduction to Regional Science. MIT.

Isserman, Andrew M., 1977, "The Location Quotient Approach to Estimating Regional Economic Impacts". Journal of American Association of Planners. pp 33 - 41.

Kee, Woo Sik, 1968, "Industrial Development and its Impact on Local Development Finance", Quarterly Review of Economics and Business.pp. 19 - 24.

Klein, L.R. 1969, "The Specification of Regional Econometric Models", Papers, Regional Science Association, Vol 23, pp. 105-115.

Leistritz, Larry F. and Steven H. Murdock, 1981, The Socio-Economic Impact of Resource Development. Methods for Assessment, Westview Press, Boulder, Colorado.

Leistritz, F. Larry, Steve H. Murdock and Arlen G. Leholm, 1982, "Local Economic Changes Associated with Rapid Growth", in Coping with Rapid Growth in Rural Communities, Eds. Bruce A. Weber and Robert E. Howell, Westview Press, Boulder, Colorado

Levin, Michael, 1975, "Cost Revenue Impact Analysis: State of the Art", Urban Land, Vol. 34, June, pp. 8 - 15.

Lewis, W. Chris, 1976, "Export Base Theory and Multiplier Estimation: A Critique" in Annals of Regional Science, Vol. 11, No. 3, pp. 58 - 70.

Lichfield, Nathaniel, 1964, "Cost Benefit Analysis in Plan Evaluation", in Town Planning Review, Vol. 35, pp. 159 - 169.

Loewenstein, Louis K., 1963, "The Impact of New Industry on the Fiscal Revenues and Expenditures of Sub-urban Communities" in National Tax Journal, Vol. xvi, No. 2. pp. 113 - 136.

Mac Arthur, J.D., 1988, "Monitoring and Evaluation During Implementation and Operation" in Project Planning in a Regional Context, University of Bradford, Yorkshire.

Mackenzie Regional Planning Commission, 1988, A Survey of Retail and Services Business in Peace River

Mackenzie Regional Planning Commission, 1988, Weberville / Warrenville Area Structure Plan,Improvement District 22.

Mackenzie Regional Planning Commission, 1989, An Economic Overview of the Mackenzie Region,

Mackenzie Regional Planning Commission, 1989, Town of Peace River Economic Base Study

Mackenzie Regional Planning Commission, 1990, Town of Peace River General Municipal Plan-1990.

Mackenzie Regional Planning Commission, 1990, Background Study for the Peace River General Municipal Plan 1990, Sections 1- 6

Masson Management Services Ltd., 1989, A Revenue Sharing Proposal for Improvement District 22.

Mathias, P., 1971, Forced Growth, James Lewis and Samuel, Toronto.

Mathur, V.K. and H.S. Rosen, 1974, "Regional Employment Multiplier: A National Approach" in Land Economics, Vol. 50, No. 1, pp. 93 - 96.

McGuire, A. 1983, "The Regional Income and Employment Impacts of Nuclear Power Stations", Scottish Journal of Political Economy, Vol 30, No. 3.

McNicholl, I.H. 1981, "Estimating Regional Industry Multipliers", Town Planning Review, Vol 52, No. 1.

Mellor, I. and R.G. Ironside, 1978, "The Incidence Multiplier Impact of a Regional Development Programme". Canadian Geographer, Vol. 22, No. 3, pp 225 - 251.

Monroe, D. T. and B.G. Robinson, 1973, Manufacturing Impact on Community Growth in Alberta, Alberta Municipal Affairs, Edmonton.

Moseley, Malcolm J., 1974, Growth Centres in Spatial Planning Pergamon Press, Oxford.

Murdock, S.H., 1979, "The Potential Role of the Ecological Framework in Impact Analysis", Rural Sociology, Vol. 44, No. 3, pp. 543 - 565.

Murdock, Steven H. and Larry Leistritz, 1980, "Selecting Socio-Economic Assessment Models: A Discussion of Criteria and Selected Models" in Journal of Environment, Vol. 10, No. 1, pp. 1 - 12.

Murdock, Steven H., L.L. Jones, F.L. Leistritz and D.R. Andrews, 1980, " A Case Study in Model Adaptation" in Computer Models and Forecasting Socio-Economic Impacts of Growth and Development, Proceedings of a Conference held in Jasper Park Lodge, Alberta, April 20-23.

Murray, James A., and Bruce A. Weber, 1982, "The Impacts of Rapid Growth on the Provision and Financing of Local Public Services in Coping with Rapid Growth in Rural Communities. (Eds.) Bruce A. Weber and Robert E. Howell, Westview Press, Boulder, Colorado.

Northern Alberta Development Council 1981, Trends in Northern Alberta, A Statistical Overview, 1971 - 1979

Northern Alberta Development Council, 1990, Trends in Northern Alberta, A Statistical Overview, 1971 - 1990.

Overseas Development Administration, 1988, Appraisal of Projects in Developing Countries, Her Majesty Stationery Office, London.

Parkinson, Anna, 1979, "Small Town Alberta - A Financial Picture". Proceedings of a Conference held in Banff Park Lodge. March 11 - 14.

Peace River Regional Planning Commission, 1976, Patterns for the Future, A Regional Policy Plan for the Peace River Region of Alberta

Peace River Regional Planning Commission, 1980, Demographic Characteristics: Peace River Region of Alberta.

Peter C. Nichols and Associates Ltd., 1979, Overview of Local Economic Development in the Athabasca Sands Region Since 1961. Alberta Oil Sands Environmental Research Program, Edmonton

Poister, Theodore H., James C. McDavid and Anne Hoagland Magoun, 1979, Applied Program Evaluation in Local Governments. D.C. Heath and Company, Lexington, Massachusetts.

Provincial-Municipal Finance: The Tax Sharing Issue and Inter-Municipal Co-operation, 1975, A Joint Study by the P Provincial-Municipal Finance Council and the Peace River Regional Planning Commission.

Reschovsky, Andrew, and Eugene Knaff, 1977, "Tax Base Sharing: An Assessment of the Minnesota Experience", Journal of the American Association of Planners, October, pp. 361 - 370.

Research and Planning Division, Human Resources Development Authority, 1969, The B - 15 Plan. An Outline For Rural Development in Alberta's Census Division 15. Government of Alberta, Edmonton, Alberta.

Richardson, H.W., 1969, Elements of Regional Economics, Penguin Middlesex.

Rohe, William M., 1982, "Social Impact Analysis and the Planning Process in the United States" in Town Planning Review, Vol. 53, pp. 367 - 382.

Rossi, Peter H. and Howard E. Freeman, 1989, Evaluation, A Systematic Approach, Sage Publications, Beverly Hills.

Roterus, Victor, 1970, "Do Small Towns have a Future?" Urban Land, Vol. 29, No. 3.

Runyan, Dean, 1977, "Tools for Community-Managed Impact Assessment" in Journal of American Institute of Planners, April, pp. 125 -135.

Scott, Anthony and Harry Campbell, 1979, "Policies Towards Proposals for Large-Scale Natural Resource Projects", Resource Policy, June, pp. 113 - 140.

Shaffer, Ron E, 1974, "Rural Industrialization: A Local Income Analysis". Southern Journal of Agricultural Economics, Vol. 6, p. 99.

Shaffer, Ron E. and Luther Tweeten, 1974, "Measuring Net Economic Changes from Rural Industrial Development, Oklahoma" in Land Economics, Vol. 50, No. 3, pp. 261 - 270.

Shaffer, Ron E., 1979, "The General Economic Impact of Industrial Growth on the Private Sector of Non-metropolitan Communities." in Non-metropolitan

Industrialization (Eds) R. Lonsdale and H.Seyler. John Wiley and Sons, New York.

Shaffer, Ron, 1989, Community Economics: Economic Structure and Changes in Smaller Communities. Iowa State University Press, Ames.

Shapiro, Barry Ira, Larry C. Morgan and Lonnie L. Jones, 1977, "The Impact of Employment Expansion on Rural Community Service Expenditure: A Small Area Model" in Southern Journal of Agricultural Economics, pp. 57 - 69.

Smith, P.J., 1982, "Alberta Since 1945: The Maturing Settlement System" in A Geography of Canada. Heartland and Hinterland. (Ed.) L.D. McCann, Prentice-Hall, Ontario.

South Peace Regional Planning Commission, 1984, Grande Prairie Area, Growth Study Update.

Summers, Gene F. and Frank Clemente, 1976, "Industrial Development, Income Distribution, and Public Policy" in Rural Sociology , Vol. 41, pp. 248 - 268.

Summers, Gene, 1979, "The Effects of Locating Industry in Small Towns: The American Experience." Proceedings of a Conference held in Banff Park Lodge, March 11 - 14.

Summers, Gene F., E.M. Beck, and C. Snipp, 1979, "Coping with Industrialization" in Non-metropolitan Industrialization
(Eds) R. Lonsdale and H.Seyler, John Wiley and Sons, New York

Syncrude Canada Ltd., 1977, Socio-Economic Impact Assessment: A Strategy for Planning, Syncrude Canada Ltd, Environmental Affairs, Edmonton, Alberta.

The University of Alberta Management Advisory Institute, 1979, Grande Prairie, Northern Market Study. Draft Report.

Thomas Consultants Inc., 1988, Commercial Growth Potential, Peace River, Alberta.

Thompson, Gerald E, 1959, "An Investigation of the Local Employment Multiplier" in Review of Economics and

Statistics. pp. 61 - 67.

Waters II, W.C., 1976, "Impact Studies and the Evaluation of Public Projects" in Annals of Regional Science, Vol. 10, pp. 98 - 103.

Webster, Douglas R., 1971, Central Places in the Peace Region of Alberta. Peace River Planning Commission.

Weiss, S.J. and E.C. Gooding, 1968, Estimation of Differential Multipliers in a Small Regional Economy, Land Economics, Vol. 44, pp. 235-244.

Wheaton, William, 1959, "Application of Cost Revenue Studies to Fringe Areas" in Journal of American Institute of Planners, Vol. 25, No. 4.

Wilson, T., 1968, "The Regional Multiplier", Oxford Economic Papers, Vol 20, No. 3.

Wright, R. W. The Alberta Economy. An Input-Output Analysis, Department of Economics, University of Alberta, Calgary.

APPENDIX ONE

LOCAL OFFICIALS INTERVIEWED FOR REPORT

R.D. Roycroft - Director of Operations, Town of Peace River

Ken Burkholder - Development Co-ordinator, Town of Peace River

Judy Lowe - Secretary/Treasurer, Town of Peace River

Rodger Cole - Regional Business Counsellor, Economic Development and Trade, Peace River

Dr. Geoffrey Tagg - Superintendent of Schools, Peace River School Division No 10.

Tom Baldwin - Director, Mackenzie Regional Planning Commission

Mas Watanabe - Research Planner, Mackenzie Regional Planning Commission.

Linsey Juniper - Assistant Manager, Improvement District 22

Mrs. Del Harbourne - Former Mayoress, Town of Manning

Carmel Ellis - Economic Development Officer, Town of Grimshaw.

Sharon Unrau - Village Administrator, Village of Nampa.

Raymond Rondeau - Town Manager, Town of Grimshaw

Harry Aspin - Administrator, Village of Berwyn

Joseph Calenda - Senior Planner, South Peace Regional Planning Commission.

APPENDIX ONE CONTINUED

N.D. Trepanier	-	Development Officer, Planning and Development Department, City of Grande Prairie.
A.J. Trepanier	-	Organization Effectiveness Manager, Proctor and Gamble Co.Ltd.
Ron Pfau	-	Administrator, County of Grande Prairie.
Wayne Crouse	-	Public Relations Manager, Daishowa Canada Ltd.

APPENDIX TWO

Population Growth - Municipalities Within the Grande Prairie and Peace River Impact Areas

Grande Prairie Impact Area

	1951	1956	1961	1966	1971	1976	1981	1986
Grande Prairie County	10,125	8,899	8,803	8,697	8,723	9,147	12,058	12,040
Grande Prairie City	2,564	8,352	8,352	11,417	13,075	17,626	24,263	26,470
Sexsmith	331	345	531	491	560	770	1,180	1,255
Beaverlodge	514	788	897	1,083	1,155	1,332	1,950	1,810
Wembley	251	272	303	299	350	507	1,176	1,210
Hythe	342	481	449	445	485	460	639	675
Total	14,127	19,137	19,335	22,432	24,348	29,842	41,266	43,490

Source: Statistics Canada

APPENDIX TWO CONTINUED

Peace River Impact Area

	1951	1956	1961	1966	1971	1976	1981	1986
Peace River	873	1,572	2,543	4,087	5,039	4,840	6,043	6,290
Grimshaw	564	904	1,095	1,378	1,714	1,665	2,368	2,575
Berwyn	288	342	347	430	474	433	585	665
Nampa	-	-	271	288	283	286	352	465
Manning	-	726	896	1,179	1,071	1,050	1,216	1,140
MD 135	1,741	1,732	2,053	2,223	1,624	1,583	1,583	1,530
ID 22	4,210	3,489	3,194	3,251	3,209	3,132	4,250	4,455
Total	7,676	8,769	10,399	12,836	13,414	12,989	16,392	17,120

Source: Statistics Canada.

APPENDIX THREE

Regression Output

Constant	19599.93
Standard Error of Y Estimate	402.80
R Squared	0.91
No. of Observations	10
Degrees of Freedom	8
X Coefficient	399.76
Standard Error of Coefficient	44.35

Actual and Estimated Population Growth

Year	Actual Population	Estimated Population
1961	19,335	-
1962	20,190	-
1963	20,982	-
1964	21,670	-
1965	22,013	-
1966	22,432	-
1967	22,431	-
1968	22,710	-
1969	23,025	-
1970	23,199	-
1971	24,353	23,997
1972	24,610	24,397
1973	26,215	24,797
1974	28,094	25,197
1975	29,463	25,516
1976	29,842	25,996

APPENDIX FOUR

Calculation of Location Quotient (LQ) and Allocation of Basic Employment

Grande Prairie Impact Area

Industry	Provincial Employment by Sectors	Sectoral Employment in Impact Area	LQ	Allocation to Basic Employment
Agriculture	86,705	1,576		1,576
Logging	875	83	-	83
Forestry Services	1,195	60	-	60
Mineral Fuels	19,155	93	-	93
Quarry and Sand Pit Ind.	350	80	-	80
Mineral Services	6,515	88	-	88
Food and Beverages	15,974	155	1.647	0
Wood Ind.	4,680	493	6.903	423
Furniture and Fixture	1,855	10	0.3533	0
Printing and Publishing	5,435	33	0.3979	0
Fabricated Metal Products	6,370	15	0.1543	0

Machinery Equipment	2,135	15	0.4604	0
Non-Metallic Products	3,835	15	0.2563	0
Refined Petroleum and Coal	2,530	15	0.3885	0
Chemical and Chemical Products	3,530	25	0.4641	0
Miscellaneous Manufact-uring	1,695	10	0.3866	0
Construction	52,430	800	1.0	0
Transportation	31,855	356	0.7323	0
Storage and Warehousing	2,245	15	0.4378	0
Communications	14,235	250	1.1508	33
Utilities	6,200	840	8.8783	745
Wholesale Trade	30,440	475	1.0223	10
Retail Trade	73,760	1,025	0.9106	0
Insurance Carriers	3,345	25	0.4898	0
Insurance and Real Estate	7,675	80	0.6831	0
Federal Govt Services	24,480	400		200

Provincial Govt Services	15,400	256		128
Local Govt Services	14,200	166	0.7661	0
Education	47,170	628	-	314
Health	42,520	614	-	307
Accommodation and Food Services	26,995	400	-	200
Amusement and Recreation	6,090	65	-	33
Personal Services	12,395	128	-	64
Services to Businesses	17,080	160	0.6139	0
Miscellaneous Services	11,470	81	0.4628	0
Religion	2,765	35	0.8295	0
Unspecified Industry	51,235	615	0.7866	0
Total	656,819	10,170	-	4,436

Multiplier =2.29

Calculation of Location Quotient (LQ) and Allocation of Basic Employment Peace River Impact Area

Industry	Provincial Employment by Sectors	Sectoral Employment in Impact Area	LQ	Allocation to Basic Employment
Agriculture	88,215	1,360		1,360
Fishing and Trapping	255	10		10
Logging and Forestry	3,835	160		160
Mining, Quarrying and Oil Well	79,760	415		415
Manufacturing	99,905	180	0.2650	0
Construction	88,555	735	1.2206	133
Transportation and Storage	65,815	635	1.4189	187
Communications and Utility	37,515	365	1.4308	110
Wholesale Trade	57,970	415	1.0528	21
Retail Trade	149,380	960	0.9451	0
Finance and Insurance	37,930	175	0.6785	0

Real Estate and Insurance Agents	25,035	80	0.4699	0
Business Services	67,985	210	0.4543	0
Gov't Services	96,970	850		425
Education	86,195	480		240
Health and Social Services	99,635	695		348
Accommodation, Food and Beverages	83,215	555		276
Other Services	111,845	420	0.5522	0
Total	1,280,015	8,700		3,685

Multiplier = 2.34

APPENDIX FIVE

TAX SHARING AGREEMENT

MEMORANDUM OF AGREEMENT MADE THIS____DAY OF _____A.D.,1990

THE MINISTER OF MUNICIPAL AFFAIRS
AS COUNCIL FOR IMPROVEMENT DISTRICT NO.22
(herein referred to as the "Minister")

and

(herein referred to as the "Municipality")

TAX SHARING AGREEMENT

WHEREAS section 114 of the Municipal Government Act provides that two or more municipalities may enter into an agreement for the sharing of taxes imposed for municipal purposes by one of the municipalities on a person having assessable and taxable property in the municipality.

WHEREAS the Peace River Pulp Mill is located in Improvement District No.22 and will be assessed and taxed for municipal purposes by Improvement District No.22.

WHEREAS persons employed at the Peace River Pulp Mill reside in several adjoining municipalities.

AND WHEREAS the Minister wishes to share with the adjoining municipalities a portion of the municipal taxes to be collected from the Peace River Pulp Mill to reflect the extent to which each adjoining municipality provides services to the employees at the Peace River Pulp Mill.

WHEREFORE THE PARTIES agree as follows:

1. Definitions

In this agreement,

(a) "Employees" means employees of the Peace River Pulp Mill as determined in accordance with the provision of this agreement;

(b) "Participating Municipality" means a municipality or improvement district that has entered into a revenue sharing agreement with the Minister pursuant to section 114 of the Municipal Government Act regarding the sharing of the municipal taxes from the Peace River Pulp Mill;

(c) "Property" means the lands legally described as follows: and the improvements located thereon which property is commonly referred to as the Peace River Pulp Mill;

(d) "Municipal Taxes" means the municipal taxes levied against the property pursuant to the provisions of the Municipal Taxation Act or similar legislation and actually collected, but shall not include the following:

(i) any taxes or rates levied on the property to meet the requisition of: a school district or division; hospital districts or boards; the Province of Alberta pursuant to the School Act; senior citizens foundations or any other requisition similar in nature in respect of which the rates and taxes must be transferred to another party or corporation;

(ii) local improvement charges, maintenance taxes or special taxes or other rates or levies of a similar nature

2. The participating municipality acknowledges,

(a) That sharing of municipal taxes by the Minister is voluntary and not required by law;

(b) That the formula provided for in this agreement may be amended from time to time if the agreement is renewed or extended;

(c) That the Minister may not wish to continue the sharing of municipal taxes beyond the first term of this agreement.

3. The Minister will, commencing in the year 1991 and for each year of the term of this agreement, pay and transfer to the Municipality a portion of the municipal taxes as calculated in accordance with the provision of this agreement.

4. For purposes of calculating the payment to be made pursuant to clause 3, the Minister will,

(a) Deduct from the municipal taxes collected any expenses incurred by the Minister in administering this agreement, without limiting the generality of the foregoing, any expenses incurred in levying and collecting the taxes, determining numbers of employees and places of residence.

(b) Allocate the municipal taxes (after the deduction of the items in 4(a) above) to the Village of Berwyn and other participating municipalities on the basis of the relationship that the number of employees of the Peace River Pulp Mill residing in each participating municipality bears to the total number of employees residing in all participating municipalities and Improvement District No.22.

The formula for the allocation of municipal taxes shall be as follows:

S = share of municipal taxes
MT = municipal taxes
A = number of employees resident in a participating municipality
B = total number of employees resident in all participating municipalities and Improvement District No.22
C = the percentage of the municipal taxes that are to be shared

$$S=MT\times\frac{A}{B}\times C$$

(c) The percentage of municipal taxes to be shared shall be as follows:

(i) In the taxation year 1991 - 50%
In the taxation year 1992 - 40%
In the taxation year 1993 - 30%

5. For purposes of this agreement the number of employees and their place of residence will be determined in accordance with the following rules:

(a) The number of employees of the Peace River Pulp Mill shall be determined as at January 15th of each year of this agreement by reference to the employment of the Peace River Pulp Mill;

(b) To qualify as an employee of the Peace River Pulp Mill for purposes of this agreement the following persons will be included.

(i) Permanent full time employees residing in a participating municipality or in Improvement District No 22.

(ii) Full time equivalent employees. The number of full time equivalent employees shall be determined by taking the total hours over the preceding year of all seasonal and part-time employees and employees of contractors employed at the Peace River Pulp Mill and residing in a participating municipality or within Improvement District No. 22 and dividing those total hours by the figure of 2,085 hours to arrive at an equivalent figure for full time employees. The full time equivalent employees shall be allocated to each participating municipality according to their residence.

(c) In the event of a conflict or dispute as to the number of employees at the Peace River Pulp

Mill or residing in any participating municipality, the final decision shall rest with the Minister.

6. The term of this agreement shall be from January 1, 1990 to December 31, 1993 subject to earlier termination of the agreement by the Minister in accordance with the terms of this agreement.

7. The assessment of the property and the determination of the municipal taxes derived therefrom shall be a matter solely within the discretion of the Minister subject only to changes made by a valid Court of Revision, the Alberta Assessment Appeal Board, or by a court of law.

8. The Minister will pay to the Village of Berwyn its share of the municipal taxes by December 31st in each year of this agreement.

9. The Minister may terminate this agreement by giving at least six months notice prior to December 31st of any year to terminate the agreement effective for the following year.

10. This agreement may be amended by mutual consent of the parties hereto.

11. The Minister may enter into similar tax sharing agreements with other municipalities as he deems appropriate so as to make them participating municipalities within the meaning of this agreement and the sharing of the municipal taxes shall be apportioned [illegible] accordance with the formula set out in this agreement.

12. This agreement is binding on the heirs, successors and assigns of the parties hereto.

IN WITNESS WHEREOF the parties have executed this agreement on the date set out above.

Witness

Minister of Alberta
Municipal Affairs as
Council for Improvement
District No. 22.

Witness

Witness